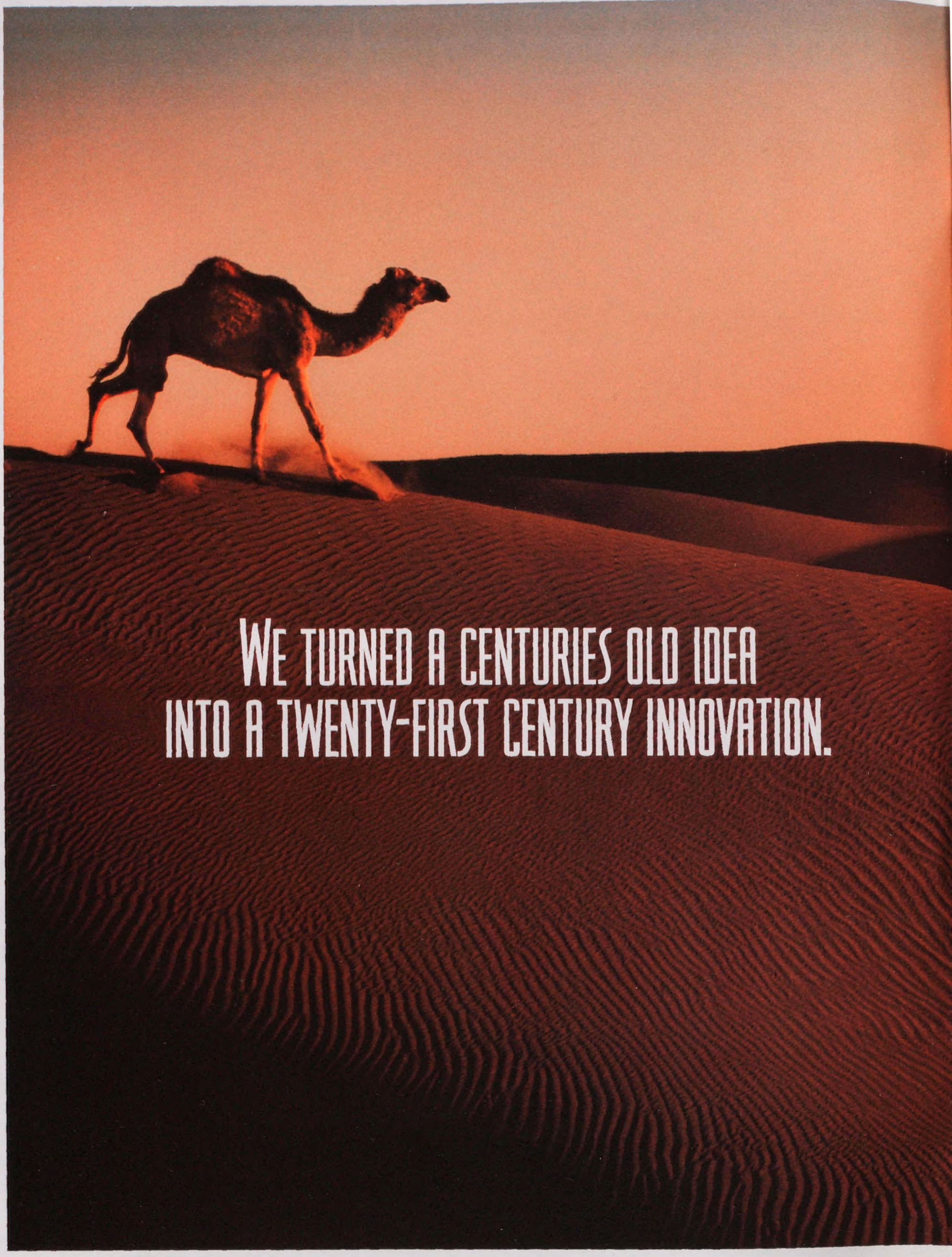
Smithsonian

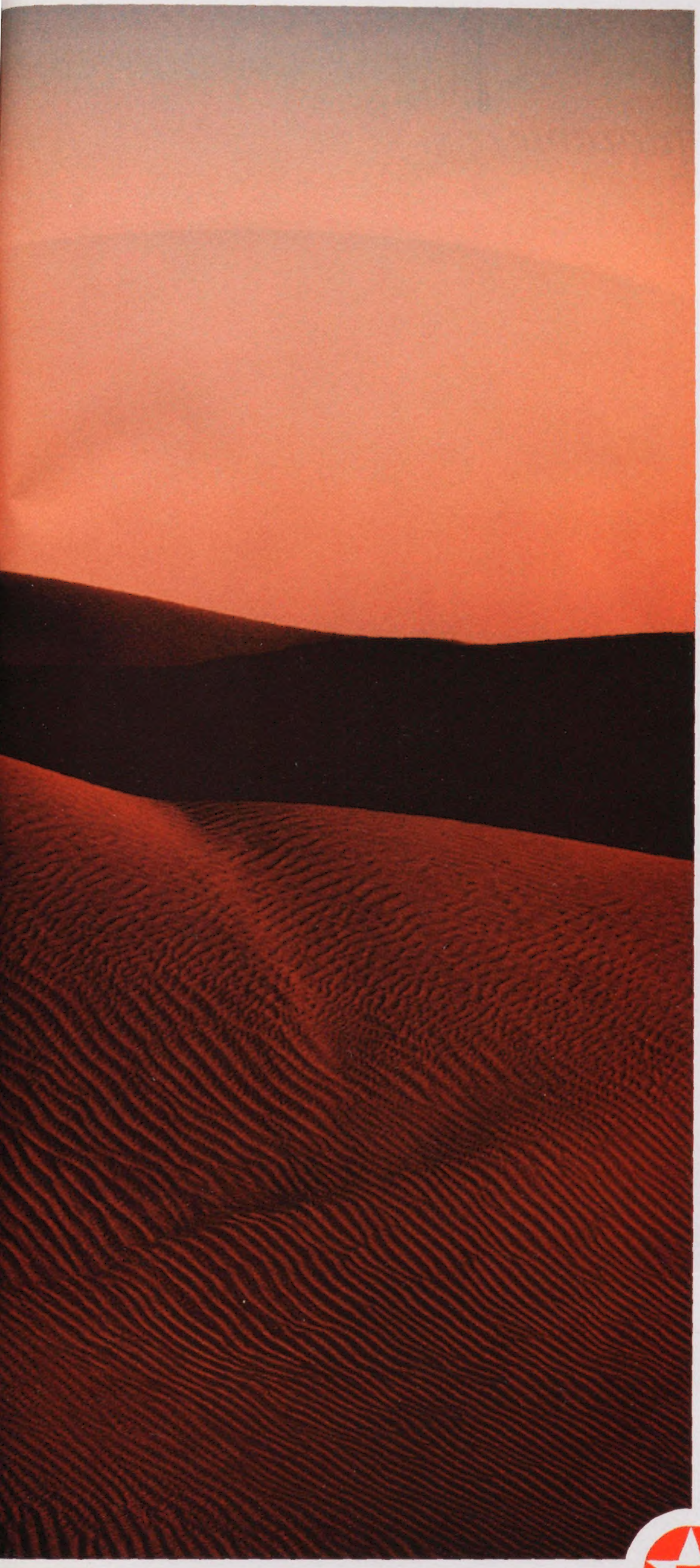
AUGUST 1999

The Enduring Allure of Turquoise

[PAGE 70]



© 1998 Texaco Inc.



150,000 MILES WITHOUT STOPPING TO CHANGE YOUR COOLANT. ANOTHER FAR-REACHING IDEA FROM TEXACO.

Until very recently, if you wanted the convenience of traveling great distances without changing your coolant, your vehicle would have to be the camel—a choice which would be quite impractical, say, for a commute on the freeway.

But thanks to the inspired thinking of scientists at Texaco, there's now a 150,000-mile coolant for cars. It's miles ahead of most conventional coolants because it lasts five times longer. In fact, it could very well last for the life of your car.

Our thirst for innovation doesn't stop there. We've also developed a system of coolants for trucks that's good for 600,000 miles, and we're working on fuels for the future that will help save energy and the environment by letting drivers travel unprecedented distances on a single tank of gasoline.

Although the noble camel has been around for centuries, we think it's got a lot of catching up to do. To find out more, stop by www.texaco.com. And see how our relentless pursuit of energy will keep the world running, in this century and centuries yet to come.

A WORLD OF ENERGY℠

We make lives memorable.

ALZHEIMER'S

We're Pfizer.

With our partners Eisai Co. Ltd.,

we introduced a medicine for a disease

that devastates families...Alzheimer's.

Last year, we spent over two billion

dollars researching Alzheimer's

and other major diseases.

That's why we believe

we'll introduce more

new medicines for more

diseases than anyone else.

We're working hard to help

families share memories and

even create new ones. The people

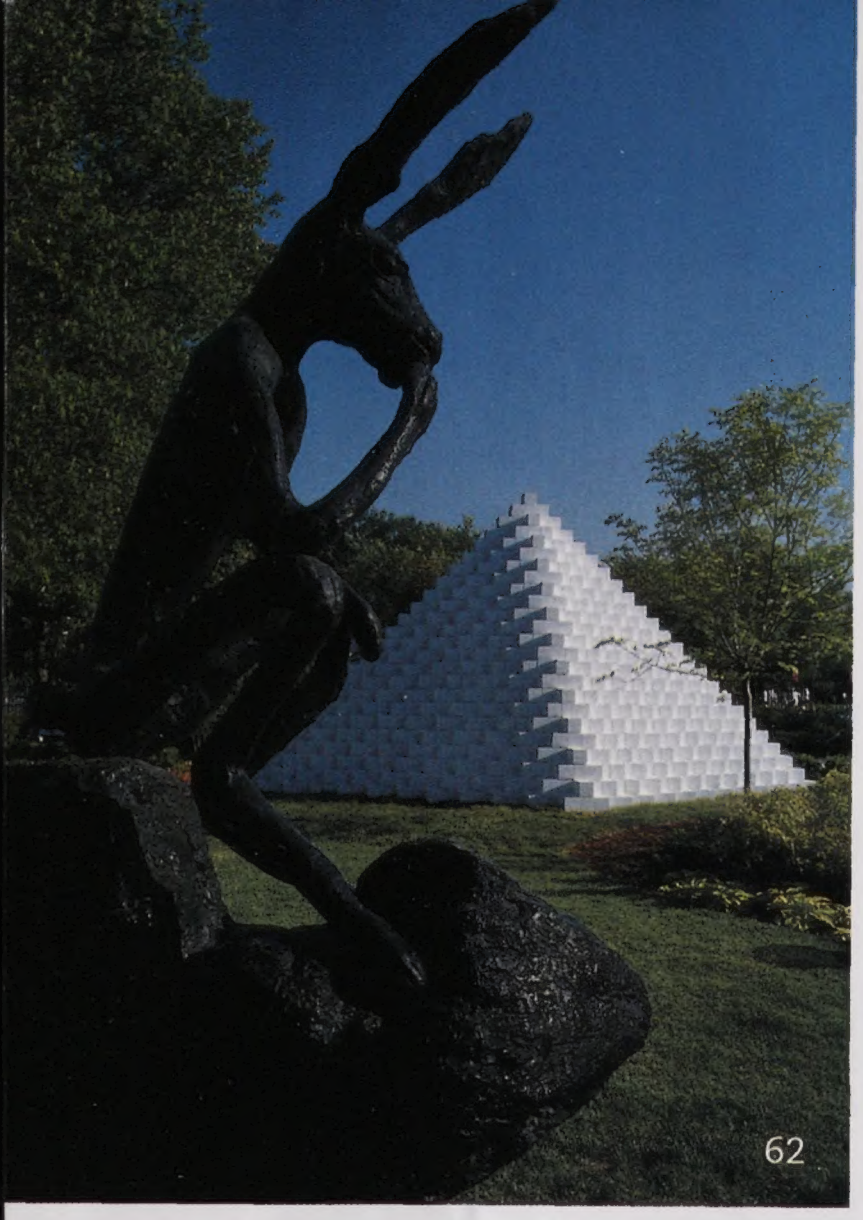
at Pfizer will never forget:

the only thing incurable is our passion.

Pfizer

Life is our life's work.

www.pfizer.com



SMITHSONIAN

features

AUGUST 1999 ▪ VOLUME 30, NUMBER 5

40 **Charting One School's Challenging Course**
Guided by the credo "Err on the side of kindness," a Vermont principal and his teachers strive to win students' hearts and minds
BY RICHARD & JOYCE WOLKOMIR ▪ PHOTOGRAPHS BY WAYNE SORCE

52 **Do Not Take the Javelina Lightly**
With its short legs and long snout, this pint-size peccary looks a lot like a pig—but don't let that fool you
BY BIL GILBERT

62 **Sculpture Blossoms in a New Garden on the Mall**
In the National Gallery's crowd-pleasing park, visitors mingle with some of the century's greatest works, and a duck or two
BY STANLEY MEISLER ▪ PHOTOGRAPHS BY DENNIS BRACK

70 **Tantalizing Turquoise**
The beauty and supposed mystical properties of this many-hued gemstone, cherished by the Aztecs, continue to fascinate
BY JOSEPH A. HARRISS ▪ PHOTOGRAPHS BY MAGGIE STEBER

82 **In the Year 1, Augustus Let the Good Times Roll**
Under his reign, Romans lived it up, enjoying an abundance of amenities, from affordable health care to gladiatorial shows
BY LIONEL CASSON ▪ ILLUSTRATIONS BY JOE FARNHAM

90 **Mount Athos, Where "Every Stone Breathes Prayers"**
For its 2,000 resident monks and for pilgrims who journey to the sacred Greek site, the Holy Mountain is "heaven on earth"
BY NICHOLAS BASBANES ▪ PHOTOGRAPHS BY GERHARD TRUMLER

100 **The Many Faces of Gustave Moreau**
Hercules, the Sphinx, the seven-headed Hydra—no figure was too fantastic for the jewel-like images of this oh so proper painter
BY BENNETT SCHIFF

110 **"There Is a Certain Amount of Humor in Checkers"**
The game's enthusiasts exhibit a killer instinct—really!—but it's balanced by a fun-loving ability to laugh at themselves
BY TIM HENSLEY

DEMOCRATS SAY TOYOTA CAMRY IS THE #1 SELLING CAR IN AMERICA, TWO YEARS IN A ROW.*

REPUBLICANS SAY TOYOTA CAMRY IS THE #1 SELLING CAR IN AMERICA, TWO YEARS IN A ROW.*

SCARY, HUH?

HEY, WITH A CAR THIS GREAT, IT'S EASY FOR EVERYONE TO AGREE. INCLUDING *CONSUMERS DIGEST*, WHICH NAMED CAMRY A "BEST BUY" FOR 1997, 1998 AND 1999.**

TOYOTA | *everyday*

©1999 Toyota Motor Sales, U.S.A., Inc. Buckle Up! Do it for those who love you. 1-800-GO-TOYOTA ✦ www.toyota.com

*Based on R.L. Polk calendar years 1997, 1998 total car registrations. **_Consumers Digest_, December 1996, 1997, 1998.

SMITHSONIAN

departments

AUGUST 1999 VOLUME 30, NUMBER 5

Cover Turquoise delights: The rings and the bracelet at left, set in the traditional clustered style, were made last year by the Wilson family, Navajo jewelers in Gallup, New Mexico, with stones from Arizona's Kingman Mine. The bracelet at right, also of traditional design, dates from the 1970s.
PHOTOGRAPH BY MAGGIE STEBER

14 Letters to the Editor

124 Picture Credits

125 Additional Sources

126 Smithsonian Study Tours

12 Smithsonian Perspectives
A New Day Begun
BY SECRETARY I. MICHAEL HEYMAN

18 Phenomena, Comment & Notes
Turning Water to Gold
BY EDWIN KIESTER, JR.

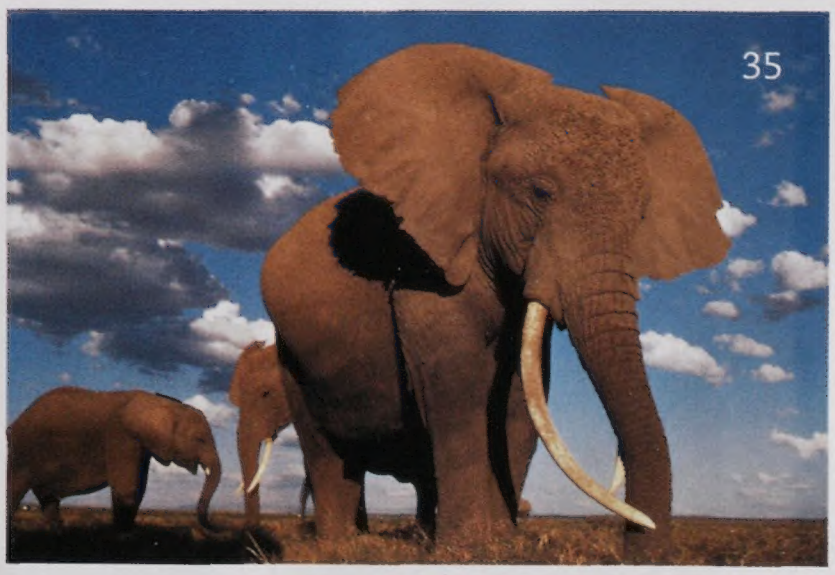
24 Around the Mall & Beyond
The Vast Influence of the Wee Microbe
BY MICHAEL KERNAN

30 The Object at Hand
Science Makes a Better Lighthouse Lens
BY BRUCE WATSON

35 Smithsonian Highlights
Life-size Not Large Enough?
Highlights Calendar starts on page 36

123 Book Reviews
Great Feuds in Science by Hal Hellman
Portraits of Discovery by George Greenstein

128 The Last Page
What Good Is a List if You Can't Read It?
BY LOUIS PHILLIPS



[THE ONLY CARD YOU NEED TO TRAVEL THE WORLD.
OR THE WORLD WIDE WEB.]

Whether you're exploring the world or just the world online, American Express wants you to be safe. That's why when you use an American Express® Card to purchase online, you will not be held responsible for any unauthorized charges. **Guaranteed.**

Visit americanexpress.com
Have a safe journey.

do more AMERICAN EXPRESS Cards

©1999 American Express.

Own a Piece of American History

Shown actual size

Original Mint Condition Saint-Gaudens Double Eagle $599

When Teddy Roosevelt commissioned sculptor Augustus Saint-Gaudens to design the magnificent Double Eagle $20 gold piece, little did he know that years later his cousin, Franklin, would have most of these beautiful works of art melted down. Today, surviving Double Eagles are as rare and revered as the American bald eagle itself.

The gold in these extraordinary coins came from the thriving mines of the Old West. The dreams of our ancestors live on among collectors like you.

A Solid Investment Opportunity

The Saint-Gaudens Double Eagle is an outstanding tangible asset investment for today's volatile economy. Now you can own one of these investment-grade, mint-condition coins for $599.

Buy With Confidence

Blanchard and Company is the nation's largest retailer of classic American coins - everything from common-date silver dollars to one-of-a-kind rarities worth as much as $1 million. And the only rare coins we sell are independently graded and certified by the Professional Coin Grading Service and Numismatic Guaranty Corporation. Furthermore, we will meet or beat any competitor's currently advertised prices, subject only to the availability of the coins and verification of the competitor's offer.

Act While Supplies Last

CALL TOLL FREE TODAY

1-800-464-2582, Ext. 792

www.blanchardonline.com

PRICE INCLUDES DELIVERY. DATES OUR CHOICE. PRICES AND AVAILABILITY SUBJECT TO CHANGE WITH NO ADVANCE NOTICE. LIMIT 1 PER CUSTOMER, NEW CUSTOMERS ONLY. ASK ABOUT OUR EXCHANGE PRIVILEGES. WE GUARANTEE ALL OF OUR COINS. CALL FOR DETAILS.

BLANCHARD

AMERICA'S RARE COIN & PRECIOUS METALS FIRM

Smithsonian

SECRETARY OF THE SMITHSONIAN INSTITUTION
I. Michael Heyman

EDITOR
Don Moser

BOARD OF EDITORS
Kathleen M. Burke
Suzanne Crawford
Jim Doherty
Alexis Doster III
Marlane A. Liddell
Sally Scott Maran
Edgar Rich, *Pictures*
John F. Ross
John P. Wiley, Jr.

ASSOCIATE EDITORS
Diane M. Bolz
Caneel Cotton, *Pictures*
Bruce Hathaway
Marian Smith Holmes
Alison C. McLean
Lucinda Moore
Beth Py-Lieberman
Ruth Ravenel
Bonnie Stutski, *Pictures*

ASSISTANT EDITORS
Elizabeth J. Erskine
Lyn Garrity
Valerie Jablow
Karen Larkins
Christian Moen
Minna Morse
Angela M. Pleasants
Sadie Quarrier, *Pictures*

RESEARCH ASSISTANTS
Karla A. Henry
Carolyn McGhee

ASSISTANT TO THE EDITOR
Rebecca Maksel

CONTRIBUTING EDITORS
Constance A. Bond
Timothy Foote
Edwards Park
Bennett Schiff
Nancy Seaman
Paul Trachtman

Smithsonian Institution

BOARD OF REGENTS

EX OFFICIO

Chief Justice of the United States, William H. Rehnquist, *Chancellor*
Vice President of the United States, Albert Gore, Jr.

APPOINTED BY THE PRESIDENT OF THE SENATE
Hon. Thad Cochran
Hon. Bill Frist
Hon. Daniel P. Moynihan

APPOINTED BY THE SPEAKER OF THE HOUSE
Hon. Sam Johnson
Hon. Ralph Regula

APPOINTED BY JOINT RESOLUTION OF CONGRESS

Hon. Howard H. Baker, Jr.
Hon. Barber B. Conable, Jr.
Ms. Anne d'Harnoncourt
Mr. Louis V. Gerstner, Jr.
Dr. Hanna H. Gray
Dr. Manuel L. Ibáñez
Mr. Robert P. Matsui
Dr. Homer A. Neal
Mr. Frank A. Shrontz
Mr. Wesley S. Williams, Jr.

SMITHSONIAN NATIONAL BOARD

Hon. Frank A.Weil, *Chair*
Hon. Max N. Berry, *Vice Chair*

Mrs. Laura Lee Blanton
Mrs. Carolyn Blount
Mr. Lafayette H. Caldwell III
Mr. Peter R. Coneway
Mr. Thomas E. Congdon
Mr. Frank Arthur Daniels, Jr.
Mr. Archie W. Dunham
Dr. Sylvia Earle
Mrs. Jane Eisner
Mrs. Patricia Frost
Ms. Nely Galan
Mr. Bert Getz
Mr. Stephen Hamblett
Mr. Frederic C. Hamilton
Mr. Paul Hertelendy
Mr. Robert L. James
Mrs. Dona Kendall
Mrs. Marie L. Knowles
Hon. Marc Leland
Ms. Elizabeth S. MacMillan
Mr. John Macomber
Mrs. John W. Madigan
Mrs. Millicent Mailliard
Mr. Michael P. McBride
Mrs. Nan Tucker McEvoy
Mr. Kenneth B. Miller
Hon. Norman Y. Mineta
Mr. Thomas D. Mullins
Mr. Henry Muñoz III
Mr. John Nelson
Mrs. Mary Ourisman
Mr. James Patton, Jr.
Mr. Heinz C. Prechter
Mr. Thomas F. Pyle, Jr.
Baron Eric de Rothschild
Mr. A. R. Sanchez
Mr. David M. Silfen
Hon. Alan K. Simpson
Mr. C. D. Spangler
Mr. Kelso F. Sutton
Mr. Jackson Tai
Mrs. Nancy Brown Wellin
Mr. Anthony Welters
Mr. Daniel W. Yohannes

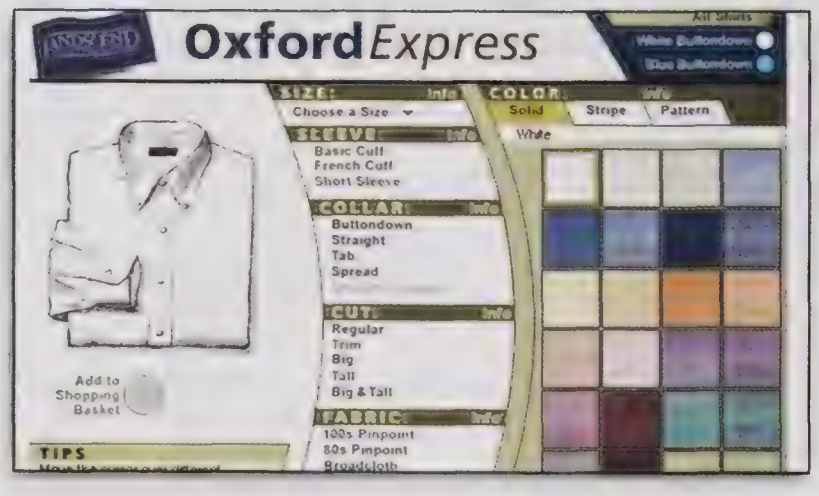
HONORARY MEMBERS

Mr. Robert McC. Adams
Mr. William S. Anderson
Mr. Richard P. Cooley
Mr. Joseph F. Cullman III
Mr. Charles D. Dickey, Jr.
Mr. Alfred C. Glassell, Jr.
Mrs. Jean Bronson Mahoney
Hon. George C. McGhee
Justice Sandra D. O'Connor
Mr. S. Dillon Ripley
Mr. Francis C. Rooney, Jr.
Mr. Wilbur L. Ross, Jr.
Mr. Lloyd G. Schermer
Mrs. Gay F. Wray

It's the same store, just a **different address.**

Your Personal Model from Lands' End
You can try clothes on her more easily than you can on yourself.
If she looks more-or-less like you, then you're ready to start. Explore, find some clothes to try, and have fun. (A good place to start is Your Style.)
If you don't think she's mirroring you accurately, you can always return to the Building My Model page to make changes.
Be sure to tell us what you think!
Your Style
Learn what body shape your model has...and what kinds of clothes will flatter her.
Clothes for you
Examine eight outfits we've put together to flatter your model.

At our Web site, you can create your own Personal Model,℠ then "try on" different outfits – without leaving home



In just a few clicks, quickly find your way among our dizzying array of men's dress shirts

YOUR SWIMSUIT FINDER
Hourglass
Home | Intelligent Order Blank | Our Store | Gift Certificates | Overstocks | Search | School Uniforms |

Find the perfect swimsuit to flatter your figure... mix and match coverups. We make it easy!

Big savings on products we ordered too much of. The deals change often – and they're *e-mazing!*

From catalog to the Web, the store is yours.™

www.landsend.com
1-800-814-1317

© 1999 Lands' End, Inc

Who puts the world in your laptop?

MAPTECH®

Digital Mapping for Land, Sea & Air

1-800-627-7236

www.maptech.com

THE OVERLANDER

Made in Australia by AKUBRA®

New from Akubra, The Overlander is the latest addition to their premium collection of pure fur felt hats. Hand braided leather hat band. Fully lined, 3¼" brim. Colors are Charcoal, Dark Fawn or Sand.

No. 1623 THE OVERLANDER $145.00

State size (6¾ through 8) and color

Add $5.00 for handling. Check, M/C, Visa or Amex. Satisfaction Guaranteed.

Request our unique catalog.

- Akubra Hats
- Filson Outdoor Clothing, Luggage
- Bills Khakis
- Fine Leather Goods, Bosca Wallets
- Northwest Coast Indian Jewelry
- Celtic Jewelry, Celtic Wedding Rings
- Maps of Britain

1-800-324-4934

9a.m.–5p.m. Pacific Time Monday–Saturday

www.davidmorgan.com

Visit our store in the Seattle area.

David Morgan

11812 North Creek Pkwy N, Suite 103, Bothell, WA 98011

BOOKS ON TAPE® #1

World's Largest Selection

TOM CLANCY

EVERY MAN A TIGER

- Bestsellers on cassette
- Nearly 5,000 titles all full-length
- Call for more information

(800) 582-9666

RECAPTURE THE GOLDEN AGE OF STEAM

Our real **"WORKING STEAM ENGINE"** has brass piston cylinder, boiler & base plate. Also has the following; forward & reverse control, centrifugal governor & a real working steam whistle. Engine runs for 15 minutes. Fired by solid fuel supplied. This unique collectors piece is available for our 25th Anniversary. Limited quantities available.

Size – L-10 1/4" x W-8 1/2" x H-10"

☐ **Wilesco D106 Steam Plant** (Reg. $269.95)

Only $229.95 Add $12.00 for S & H

☐ Stunning color steam catalog covers 100 different models, accessories & parts $6.95 refundable with order

We Accept VISA, MC, Certified Check or C.O.D.

YESTERYEAR TOYS & BOOKS INC.

DEPT. SM9, BOX 537, ALEXANDRIA BAY, NY 13607

TOLL-FREE PHONE: 1-800-481-1353

Internet:www.yesteryeartoys.com

Smithsonian

EDITORIAL & PUBLISHING OFFICES:
900 Jefferson Drive, SW
Rm 1301, MRC 406
Washington, D.C. 20560

INTERNET ADDRESS:
www.smithsonianmag.si.edu

SUBSCRIPTIONS: 1-800-766-2149
(outside of U.S., call 1-904-445-4662)

PUBLISHER
Ronald C. Walker
Michelle A. McMahon, *Executive Assistant*

ADMINISTRATION
Carey O. Randall, *Associate Publisher*
Valerie Martin, *Business Manager*

CIRCULATION
Scott I. Rockman, *Director*
Carolyn Topak, *Marketing Director*
Elizabeth Hopkins, *Planning Director*
Andrea Sole, *Fulfillment Director*

PRODUCTION
E. Cherry Doyle, *Director*
Greg Williams, *Quality Manager*
David Sterling, *Editorial*
Katherine Balch, *Advertising*

ADVERTISING
David C. Cator, *Associate Publisher, Advertising*
Hamlin M. Gilbert, Jr., *Advertising Services Director*
Lorraine Sakli, *Marketing Director*

NEW YORK 420 Lexington Avenue
Suite 2335, New York, NY 10170-0084
212-490-2510 ◆ fax: 212-986-4259

ATLANTA Brown & Company
770-998-2889 ◆ fax: 770-552-8250

CHICAGO Warden, Kelley, Allen & Opfer
312-575-1100 ◆ fax: 312-575-1107

DETROIT Heth & Associates Inc.
248-642-7273 ◆ fax: 248-642-1321

LOS ANGELES
Charles E. Schmuck & Associates
310-478-3833 ◆ fax: 310-478-1633

SAN FRANCISCO
Charles E. Schmuck & Associates
415-986-1945 ◆ fax: 415-986-1159

TOKYO
International Communications Inc.
81-33-593-1441 ◆ fax: 81-33-580-0414

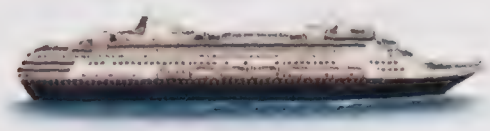
MEXICO
Towmar Representaciones Profesionales
525-395-5888 ◆ fax: 525-395-4985

FOUNDERS
S. Dillon Ripley
Edward K. Thompson

PUBLISHER EMERITUS
Joseph J. Bonsignore

TODAY IN THE WORLD

Tea is being served off the Amalfi coast, there's a rainforest lecture at 10:00 near Costa Rica, fresh prawn curry is on the menu southwest of Shanghai, lovers discover a private Caribbean isle.



SOMEWHERE RIGHT NOW A Holland America ship is sailing. It's distinguished by five-star elegance, graced with art and antiques, and carrying lucky, curious people who will rise to discover dreamed-of places in the world. Today, Holland America will explore the world's most desirable islands, beaches, cities, and sights. (We know. We've spent 125 years collecting the best of each region firsthand.) Along the way is a fascinating program that brings the art, music, and culture of each destination to life; the most extensive menus at sea; and a level of five-star service that's all the more amazing considering tipping is not required. The world is big. But for the best places in it, space is limited. Send in the attached card to begin your adventure today.

Holland America
A TRADITION OF EXCELLENCE

ALASKA ASIA CANADA CARIBBEAN EUROPE HAWAII MEXICO PANAMA CANAL SOUTH AMERICA WORLD VOYAGE

SMITHSONIAN

PERSPECTIVES

A New Day Begun

COMMITTED TO ITS COMMUNITY, THE SMITHSONIAN'S ANACOSTIA MUSEUM SETS LOFTY GOALS FOR THE FUTURE

WHEN THE ANACOSTIA MUSEUM OPENED ITS DOORS IN Southeast Washington in 1967, a new day had begun at the Smithsonian. The community-based museum quickly became known for its exhibitions focusing on African-American history and culture, innovative educational programs, and an array of activities that addressed the social issues affecting its constituents and neighbors. The museum was a pioneer in erasing the boundaries between museum and community.

A pioneering spirit continues to shape the scholarship, exhibitions and programs of the Anacostia and now the Center for African American History and Culture, with which it merged in 1995. The new entity mounts a series of thoughtful and engaging exhibitions in galleries in the Arts and Industries Building on the National Mall and in the Anacostia location. Currently on view are "Speak to My Heart: Communities of Faith and Contemporary African American Life," which is framed by a soaring timber structure in the Arts and Industries Building, and in Anacostia, "Locating the Spirit: Religion and Spirituality in African American Art." The latter inspired this year's well-attended James A. Porter Colloquium on African American Art, an annual scholarly discussion cosponsored with Howard University.

This fall, the Anacostia will cosponsor "Wrapped in Pride: Asante Kente and African American Identity," an exhibition mounted with the National Museum of African Art, and will join forces with the National Museum of Natural History for a Kwanzaa celebration when NMNH opens its newly renovated hall on African history and culture. One of the most exciting events sponsored by the Anacostia is Carnival, its annual Black History Month masked ball. Supported by the corporate community, individual donors and generous friends at the Canadian Embassy, this fundraiser transforms the Smithsonian Castle into a virtual wonderland reflecting the African diaspora.

The promise of the future is seen in the faces of the students who participate in our partnership program with Lucy Ellen Moten Elementary School, a local public school. These students, who were also featured in a television special during the Smithsonian's 150th Anniversary celebration, create exhibits, develop oral history projects and participate in history fairs.

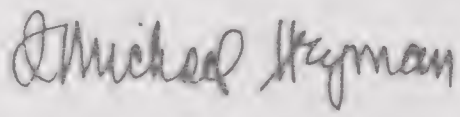
Building upon these activities, the museum is poised to face the challenges of a new millennium. Borrowing a phrase from James Weldon Johnson's anthem "Lift Ev'ry Voice and Sing," the staff is embarking upon a campaign we are calling "A New Day Begun." It begins with a $5 million renovation of the Anacostia Museum building in 2000 that sets the stage for future expansion in research and collecting activities, all of which will require increased commitment and support from the private sector.

Exhibitions and publications in the next few years will be infused by new research on the African-American family and community celebrations, photography and culinary traditions. Plans are also being developed for an in-depth study of the significance of Carnival traditions developed by black communities in the Caribbean and other places, such as Canada and England.

In order to provide future generations of scholars and museum visitors with material evidence of the African-American experience, the Anacostia is organizing long-term collecting endeavors that will expand the current holdings of more than 7,000 works-on-paper, paintings, photographs, manuscripts and other objects, such as Marian Anderson's fur coat worn at her 1939 concert on the steps of the Lincoln Memorial. Plans are being made for collections development and fundraising activities in Los Angeles and New York with the goal of creating the nation's most comprehensive collection of costumes, props, scripts and material related to the lives of African-Americans in the performing arts.

And just to round things out, Steven Newsome, the director of the Anacostia, has been instrumental in the development of three African-American-focused movies, a joint project between the Smithsonian and the Showtime Network, which will air in the next few years.

If S. Dillon Ripley, the Smithsonian Secretary who led the efforts to create the Anacostia Museum, and the late John R. Kinard, its founding director, visited the museum's galleries today, I am certain they would agree that, again, a new day has begun.



I. MICHAEL HEYMAN, SECRETARY

His great grandfather was a Honda Civic.

Can it be possible for a robot to inherit style? Power? Intelligence? Assuming the robot is the revolutionary new Honda P3, the reply is "yes." After all, Mr. P3 comes from a long line of Honda products which share those traits.

With a design based on extensive knowledge of human movement, P3 walks, climbs stairs and turns corners with ease. He carries loads. He pushes carts. He makes U-turns. All while maintaining a remarkable sense of balance and strength.

P3 is merely one illustration of the many innovative ideas now taking shape at Honda. We're also hard at work on new technology for jet engines. Solar cars. Community-shared vehicles.

Ideas that, like P3, are designed to work in harmony with humans. And, ultimately, will help us create new dimensions in mobility. So, in other words, it seems P3 is just like his great grandpa, after all.

HONDA
Thinking.

© 1999 American Honda Motor Co., Inc. www.honda.com

HIGHWAY 1

THANK YOU FOR THE JUNE ARTICLE by Heather Millar, "The Ups and Downs of Highway 1." It seems that Highway 1 workers have experienced the "adrenaline rush" since its conception. When Highway 1 was originally built, my father, Jesse Knight Dodge, born in 1898, worked as an independent contractor. He told me of a woman ranch owner who was angry about the highway coming over her property. There was to be a deep cut along that section of highway, so he requested permission to come onto her property and build her an access to it from her ranch road. She angrily threatened him with a pistol and chased him off her property. They built the highway and left her ranch road high above it. She and her armed ranch hands would ride their horses back and forth on the ranch road and threaten to shoot the highway crew working below.

Anna Savelesky
Walla Walla, Washington

HOT DOGS

HOW COULD DONALD DALE JACKSON not have mentioned, in his article "Hot Dogs Are Us," the favorite hot dogs of M*A*S*H's Cpl. Max Klinger? The dogs came from the real Tony Packo's Cafe in the television character's Toledo, Ohio, hometown. Part of Packo's decor are hundreds of autographed hot dog buns, happily signed by visiting celebrities. These are protected behind plastic frames and adorn the restaurant's walls.

Shirley J. Shelt
Maumee, Ohio

IN ROCHESTER, NEW YORK, WE PREFER "white hots," which Vic and Irv's Refreshments has been selling on "hot dog row" since the 1930s, to the Coney Island-style dogs that most people eat. We refer to the latter as "steamers." White hots (which were once known as "pork hots" when the restaurant used that other white meat) are made of spicy ground veal. They are split so their skin won't pop open when they're grilled. Then they're cradled inside a toasted roll and topped with a secret sauce. Homemade french fries round out the meal.

Ken Nichols
Rochester, New York

YOUR ARTICLE ALLUDES TO A MAN who was fed franks before the age of 1. I hope none of your readers emulates this feeding style. Hot dogs are the most common reason for food-caused asphyxiation in young children, and pediatricians must advise parents of this fact.

Howard Fischer, M.D.
Detroit, Michigan

THOSE OF US WHO ESCHEW MEAT DO not have to give up the great American tradition. Vegetarians can enjoy a number of soybean-based hot dogs available in supermarkets and health food stores.

Jim Massey
Winter Haven, Florida

YOU NEGLECTED ONE OF THE BEST of all the hot dogs: Hebrew National. As their advertisements explain, they have to be better. They answer to a Higher Power.

Michael Brooks
Carlsbad, California

AROUND THE MALL & BEYOND

I WAS INTERESTED IN THE COLUMN by Michael Kernan about the renovations currently under way on the Washington Monument. My grandfather Henry S. Rawdon was the director of the metallurgy division of the Bureau of Standards for many years. The picture [below] shows my grandfather, on the far right, posing with scientists and engineers from the U.S. government and from the Aluminum Company of America (now Alcoa) at the top of the Washington Monument on October 17, 1934.

While standing on a temporary, ten-foot square wooden platform, without railings, the six men conducted experiments on the small aluminum cap and the gold-plated copper lightning rods to see how they had fared for 50 years. They reported that everything was in remarkably good shape.

Andrew S. Rawdon
Fairport, New York

DURING THE 1964 RENOVATION OF THE exterior of the Washington Monument, I joined the workers on the 500-foot scaffold to examine and report on the condition of the 100-ounce aluminum capstone, which was the first use of aluminum in architecture. I represented Alcoa Research Laboratories, which was interested in the effects of long-term exposure on aluminum products.

Before being placed atop the monument in 1884, the capstone, which had been cast by William Frishmuth using a method he devised, was exhibited on the floor of Tiffany & Company in New York. It was re-

INTRODUCING KODAK BLACK & WHITE+

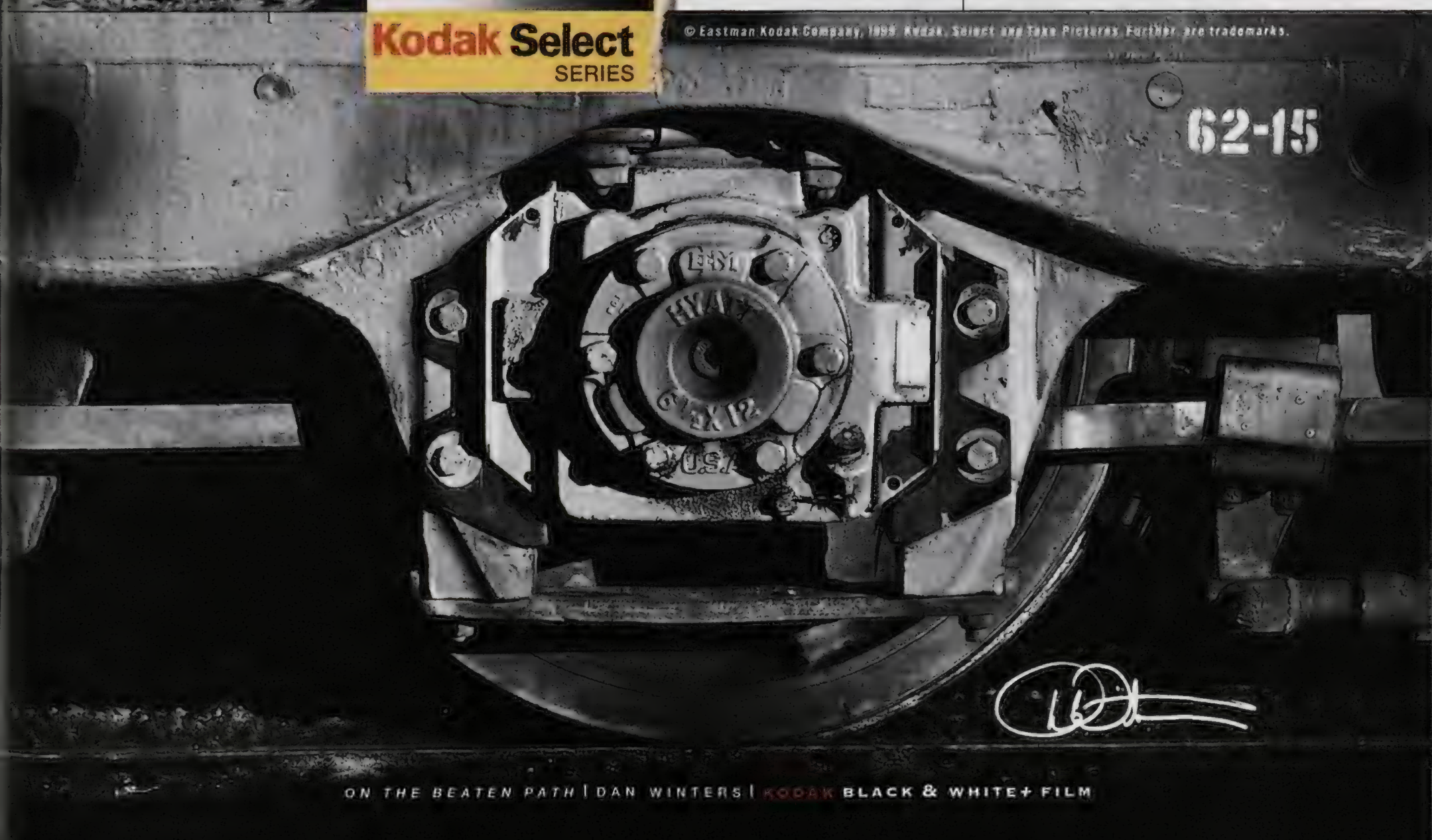
THE B&W FILM YOU CAN PROCESS ANYWHERE.

ANYWHERE THEY DO COLOR, THAT IS. WHETHER YOU'RE IN THE COUNTRY OR THE CITY, JUST CHECK THE COLOR BOX (YES, IT'S THE BOX MARKED "COLOR" ON THE PHOTOFINISHING ENVELOPE) AND GET FINE-GRAIN B&W PRINTS AT THE CONVENIENCE AND PRICE OF COLOR.

☒ COLOR
☐ B&W
☐ SLIDES

TAKE PICTURES. FURTHER.™
WWW.KODAK.COM

© Eastman Kodak Company, 1998. Kodak, Select and Take Pictures. Further. are trademarks.



ON THE BEATEN PATH | DAN WINTERS | KODAK BLACK & WHITE+ FILM

ported that visitors delighted in saying, "I stepped over the top of the Washington Monument."

Several inscriptions were etched into the sides of the capstone. The one on the east face aptly says: *Laus Deo* (Praise God).

Frank McGeary
Melbourne, Florida

IN 1998, THE UNITED STATES PARK Service hauled away boulders from the same quarry in Cockeysville, Maryland, that had supplied marble for the original construction of the Washington Monument. The donated boulders will be cut to make the dutchmen. The quarry is best known for providing the stone for the white-marble row house steps in Baltimore.

Since the 1930s, the Beaver Dam Swim Club has occupied the site.

James K. Lightner
Cockeysville, Maryland

FARMERS' MARKETS

BEING VERY HAPPILY MARRIED TO AN excellent cook and living a block away from New York's Union Square Greenmarket, I enjoyed the article by Valerie Jablow and Bill Horne.

I also have an office in Philadelphia near the Reading Terminal Market. Developed in the former Reading Railroad passenger terminal, this market has all the usual veggies, with an awesome accompaniment of Pennsylvania Dutch delights. And the ambience of the Reading Terminal is similar to Seattle's Pike Place Market—but without the fishmongers tossing 20-pound salmon to each other.

Nicholas Hayes
Philadelphia, Pennsylvania

LONG AGO, MY MOTHER WOULD TAKE us in tow to Detroit's now-defunct Western Market, located on Michigan Avenue near Tiger Stadium and the Michigan Central Depot, where she took advantage of the harvest. In his later years, my father, by then a prosperous lawyer, made the Saturday morning trips to the still-thriving Eastern Market to buy for his menu and reconnect with his country boy roots. Many of us still visit the market just to regenerate our batteries.

K. Pat Schuesler
Dearborn, Michigan

GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT

I COMPLIMENT JIM DOHERTY ON HIS article about the Grand Staircase-Escalante National Monument and on his ability to capture the feeling of being in some of the most stunning landscapes on earth. Their astonishing beauty has brought millions of visitors to our state. Sadly, the monument is one of the few places in Utah, other than our national parks, that are

IMAGINE EVERY SHADE OF BLUE UNVEILING BEFORE YOU, SPILLING ACROSS A LIMITLESS SKY. HERE, THE HORIZON IS FILLED WITH POSSIBILITY. YOU CAN SPEND ALL DAY ON SHORES OF PINK AND WHITE SAND. LOSE YOURSELF IN A FLOWER FOREST. PLAY A ROUND ON TROPICAL GREENS. HERE, THERE ARE A THOUSAND BEAUTIFUL WAYS YOUR DAY CAN UNFOLD. FOR RESERVATIONS, PLEASE CALL YOUR TRAVEL AGENT OR 1·888·BARBADOS.

BARBADOS

JUST BEYOND YOUR IMAGINATION

protected from exploitation. The remaining wild and pristine areas have been left open to development by oil, gas and mining companies, and to abuse by off-road vehicles whose knobby tires tear the fragile desert soil.

Citizens in Utah have conducted an exhaustive inventory of the few remaining wild places. Their results are incorporated into the America's Redrock Wilderness Act which, when approved by the U.S. Congress, will permanently protect about nine million acres of the endangered areas.

Tom Price
Southern Utah Wilderness Alliance
Salt Lake City, Utah

ALTHOUGH I THOROUGHLY ENJOYED your article, I found one error. Pack rats, also called wood rats, are not voles. Both are rodents and members of the family Muridae, but each is in a separate subfamily. As a graduate student, I live-trapped wood rats in Illinois for three years and found them to be fascinating creatures.

Anne-Marie Monty
Indianapolis, Indiana

THE CLOSING PHOTOGRAPH ON PAGE 103 shows a slot canyon in Arizona's Antelope Canyon, not in Round Valley Draw, Utah.

Peter N. Dickson
Cincinnati, Ohio

TO SAY THAT UTAHNS LIVING NEAR the Grand Staircase-Escalante National Monument felt slighted by President Clinton's impromptu creation of the monument is an understatement. The 1996 disclosure didn't even take place in Utah, but in Arizona.

In 1997, when our lieutenant governor, Olene Walker, visited the White House, she told the President that if he were ever looking at naming a national monument in one of our neighboring states, he should come to Utah to make the announcement.

Manny R. Mellor
Lehi, Utah

WRITE TO SMITHSONIAN

Letters for consideration in this column must include your full name, address and daytime telephone number. Transmit mail to LettersEd@simag.si.edu or send it to Smithsonian Letters Editor, P. O. Box 44400, Washington, D.C. 20026-4400. Letters may be edited for clarity and length. Send all other queries and comments to Smithsonian, 900 Jefferson Drive, Washington, D.C. 20560-0406.

Mother Nature's Treadmill
Mother Nature's Energy Bar
NATURE VALLEY
The crunchy 100% natural energy source made from whole grain oats
The Energy Bar Nature Intended.®
GMI 1999 Nature Valley is proud to have donated $240,000 to The Nature Conservancy since 1998.

Turning Water to Gold

CONFRONTED WITH A HILL FULL OF GOLD, MINERS REMOVED THE HILL AND THE GOLD—AND LEFT A MESS BEHIND

BY EDWIN KIESTER, JR.

In California 125 years ago, high-pressure water jets turn a hill into a slurry containing gold ore.

CALIFORNIA HISTORY ROOM, CALIFORNIA STATE LIBRARY, SACRAMENTO

IT MIGHT BE BRYCE CANYON NATIONAL PARK IN Utah, or perhaps Colorado's Garden of the Gods. The eerie landscape, tucked into the foothills of California's Sierra Nevada, boasts spectacular topography. California park ranger Ken Huie flashes an ironic smile. "Isn't nature wonderful?" he says jokingly.

In fact, the striking sculptures of Malakoff Diggins State Historic Park are not the handiwork of Mother Nature, but of her children. Dating back a mere 140 years, their haunting if hideous beauty testifies to an early case of environmental assault—but one in which the good guys finally won. Here was fought one of the first successful environmental lawsuits in U.S. history.

When the cry of "Gold!" went up in California in 1848, the pioneering prospectors had little to do but pluck flakes and nuggets of gold out of streams. Those easy pickings didn't last long. Miners then moved on to panning, in which gravel and water are gently rocked in a handheld pan until the water gradually carries away the gravel and leaves the heavier gold behind. Placer mining, panning on a grand scale, uses sluices and flumes to separate gravel and gold. Hard-rock mining tunnels into the earth to extract gold ore from buried veins.

Eventually, miners hit upon the cheapest way of "getting gold out of the secret places," in Huie's words. Hydraulic mining applied a simple method familiar to all who've used a garden hose. Direct a forceful stream of water at the earth, and it will carve a ditch and carry away the loosened soil. Harnessing water under powerful pressure thus could blast away the hillsides concealing gold ore. Then the water and earth could be fed through sluices and riffles to catch the gold. In the late 1860s, Julious Poquillon

dinner for 37, chez marcella: $2,416

one happy 50th birthday card: $1.95

one leopard-print, peekaboo nightie: $45

still being able to make her blush:

Platinum MasterCard® has a high spending limit
for the things that matter.

there are some things money can't buy.
for everything else there's MasterCard.™

© 1999 MasterCard International Incorporated

www.mastercard.com

bought up cheap land along the Yuba River, where Huie and I are now standing, and the North Bloomfield Gravel Mining Company was launched.

"Hydraulic mining was born and raised here in California," Huie is saying. "And no matter what you think of the result, it was a tremendous engineering feat." The key to success was lots and lots of water, year-round, in dry seasons as well as wet. Engineers built a network of reservoirs, lakes, ditches and flumes extending as far as 40 miles to catch every precious drop of rain or Sierra snowmelt. Propelled by gravity along a vertical drop of up to 500 feet, the captured waters converged into a single, powerful stream. Then they were fed into water cannons trained on the gold-bearing hillside.

Huie leads me to one. "A single monitor [water cannon] with an eight-inch nozzle like this could direct 16,000 gallons of water a minute," he says. "It could tear away 4,000 cubic yards of earth from the hillside every day." Into the sluices went the result, out came the gold, and the rest was dumped into the Yuba and sent downstream.

In 1875, a flood left thick, gooey mud in the streets, stores and homes of Marysville.

And what a load the river carried! Tons and tons of earth, rocks, trees, shrubbery, silt and a mucky mixture of mud, sand and gravel known as "slickens." The once-crystal Yuba turned chocolate brown. So did the Feather River, into which the Yuba emptied, and the Sacramento. The brown waters extended all the way to San Francisco Bay.

Who cared? What was the land for? Wrest what goodies you could and move on, was the get-rich-quick refrain. During the peak years of hydraulic mining in California, tens of thousands of men found work. By 1875, North Bloomfield had become a thriving settlement, complete with hotels, saloons, groceries and dry goods stores, breweries, a bank and a livery stable.

On the heels of the gold rush, however, had come other settlers. As early as 1873, downstream farmers began to protest the great glaciers of mud and silt that inundated their croplands every spring. As much as three feet of slickens would cover the rich wheat fields, destroy the fruit orchards, bury roads as fast as they were built. The towns of Marysville and Yuba City, at the confluence of the Yuba and Feather rivers, were repeatedly flooded. The bed of the Sacramento River rose 16 feet.

The miners brushed aside all complaints with arguments like those heard in environmental cases today. Regulation would be costly and bring ruin to a prosperous industry; miners would be thrown out of work; towns would be desolated. Besides, the mine owners were perfectly within their property rights. After all, didn't they hold water rights to the land, granted by state law and federal patents? The rivers themselves belonged to everybody.

Finally, in 1875, a particularly disastrous flood struck the Sacramento Valley, sending enough water swirling through Marysville to fill its streets with thick, gooey mud. State engineer William Hammond Hall's report was shocking. Hydraulic mining had dumped millions of cubic yards of earth, rocks and debris into the Yuba. North Bloomfield Gravel Mining alone had poured in more than 20 million cubic yards a year.

Lining up with the farmers was the Central Pacific Railroad (later the Southern Pacific). The politically powerful railroad not only counted on mud-free riverside tracks but was a large landowner throughout the valley. With its backing, the farmers made a federal case of the controversy, and in 1882, a New York resident and Marysville property owner, Edwards Woodruff, filed suit before Judge Lorenzo Sawyer.

Woodruff v. North Bloomfield Gravel Mining Company dragged on for nearly two years. Mountains of testimony told of losses to landowners like Woodruff and legal rights held by mining companies, with innumerable visits by the court and witnesses to observe the damage firsthand. In January 1884, Sawyer, who himself had come to California as a gold-seeker, presented a 255-page decision. Hydraulic mining was not illegal, Sawyer wrote, but by dumping its tailings into the river, North Bloomfield not only violated the rights of those downstream but despoiled the landscape and watershed that were not its to destroy. The company could practice hydraulic mining on its own land but was required to impound the debris. It could no longer simply dump it into the river.

Church bells rang jubilantly in Marysville that night. Hydraulic mining soon went into decline. Hydraulic mining's residue, of course, continued to seep into the river, and the California Debris Commission monitored the debris dams for years.

The abandoned "diggins" became Malakoff Diggins State Historic Park in 1996. About 27,000 visitors a year drive down the twisting narrow road to admire the colorful formations. Most are campers and hikers, who peek in the restored general store, which closed in 1942 and still displays boots and shovels and miners' gear left behind. Or they simply marvel at the last of the eight monster water cannons that once pulverized the hillside, day and night.

"It's an irony, isn't it?" Ken Huie is saying. He has just shown me a mile-and-a-half-long tunnel that drained the mine. "It cost the company about three and a half million dollars to construct all this. And all they got back, according to the best estimates, is three and a half million. For all the effort and the damage, they just about broke even."

You know what they say,
watch out for the quiet ones.

Park Avenue by Buick
luxury, pure and simple.™

GM

Visit the elegant Park Avenue at www.parkavenue.buick.com or call 1-800-4A-BUICK.

©1999 GM Corp. All rights reserved. Park Avenue is a registered trademark of GM Corp. Buckle up, America! Park Avenue Ultra shown.

Prospectuses containing more complete information including management fees, charges and expenses are available from Schwab. Please read the prospectus carefully before investing.

*Schwab's short-term redemption fee will be charged on redemptions of funds (except SchwabFunds) bought through Schwab's Mutual Fund OneSource service (and certain other funds) with no transaction fee and held for 180 days or less. If you pay a transaction fee to purchase a fund, you will pay a transaction fee when you sell it as well. Schwab reserves the right to change the funds we make available without transaction fees and to reinstate fees on any funds. Schwab receives remuneration from participating fund companies.

Ready to move up?

"I'm not concerned about paying loads and transaction fees*.

Schwab Mutual Fund OneSource® doesn't charge them."

LEILANI ALSO LIKES SCHWAB BECAUSE THEY HAVE SO MANY MUTUAL FUNDS IN ONE PLACE. AND THEY CONSOLIDATE EVERYTHING IN ONE MONTHLY STATEMENT.

"I was a homemaker, raising three children," says Leilani. "When my husband passed away, I didn't know anything about investing. It was very difficult. I went to two brokerage firms who both charged big loads and fees."

And Schwab?

"Most of my mutual funds are now from Schwab Mutual Fund OneSource. All the funds there are no-load, and there are no transaction fees. And it's organized. You get your account information in one monthly statement that tells you how to read it. Schwab is constantly teaching and helping."

With OneSource, Leilani can choose from over 1,000 no-load, no-transaction-fee mutual funds from most of America's best-known fund families. At Schwab, you also have access to nearly every top-performing no-load fund that was rated 4 or 5 stars by Morningstar based on historical performance.

Charles Schwab on investing

"Over the long run, sales charges, loads and high expenses can drag down the performance of even a well-diversified portfolio."

Charles R Schwab

You can also obtain prospectuses on individual funds at Schwab which should be read carefully before investing.

"For a widow and a single parent on a fixed income, it's the best thing for me," Leilani says.

And what about Schwab's investment specialists?

"They're very knowledgeable. They explained everything. They really care about their customers."

Any closing thoughts, Leilani?

"I feel comfortable at Schwab. They've made such a big difference in my life. They renewed my faith. They've lowered my anxiety level. I'm in control. But I'm not in it alone."

If you're ready to move up to Schwab, call 1-800-5NO-LOAD, log on to our website at www.schwab.com or visit us at any of our over 300 branches.

Individual appearing is an actual Schwab customer and was compensated. The experience depicted is that of the individual appearing and may not be representative of anyone else's experience and is not indicative of future performance or success.

**Based on asset level of direct-marketed stock and bond funds rated 4 or 5 stars by Morningstar and available to individual investors through mutual fund supermarkets (Schwab makes available 107 of 115 funds in top quartile). SOURCE: Strategic Insight Simfund. Morningstar proprietary ratings reflect risk-adjusted performance as of 2/28/99 and are subject to change every month. Ratings are calculated from the funds' 3-, 5-, and10-year rating. Total funds for the 3-,5-, and 10-year periods were 6,729, 4,136, and 1,585 respectively. ©1999 Charles Schwab & Co., Inc. All rights reserved. Member SIPC/NYSE (0599-3135)

Charles Schwab

The Vast Influence of The Wee Microbe

BY MICHAEL KERNAN

YES, I KNOW, WE'RE ALL into Big these days, gaping at far galaxies via the Hubble telescope and, some of us anyway, stretching our imagination to the edge of the universe with *Star Wars*.

But there are worlds as Small as big is Big, and they can be just as exciting and even scary.

A new traveling exhibition, "Microbes: Invisible Invaders . . . Amazing Allies," is on view at the Smithsonian International Gallery through September 6. Designed by BBH Exhibits of San Antonio, Texas, the show was brought to Washington as a feature of SITES, the Smithsonian Institution Traveling Exhibition Service. From here it goes to Chicago, one of the many stops on a five-year tour ending in 2003.

Covering 5,000 square feet and bubbling with interactive gadgets, the show aims to tell children (that's what it says, but I am learning a few things myself) that microbes are more than simply "germs," that they include viruses, bacteria, fungi and protozoa, and it delves into their history, which as far as most people are concerned means basically the history of disease.

A youngster examines a hologram of the penicillium fungus, the world's first source of antibiotics.

As Smithsonian Provost J. Dennis O'Connor sees it, children would do well to learn more about this invisible world: "If we can capture their imaginations now, we ensure our supply of microbiologists for the next generation. At least we can get them to wash their hands more often."

There is a video game in which players fire antibiotic ammunition at bacteria. In another game, two computer microbes race to a finish line while the players maneuver them through simulated arteries in 3-D animation. Or players can steer oil-eating microbes as they gobble up an oil spill like Pac-Man. A cartoon hero, Microbe Man, answers questions fired at him on a game show, and in a kitchen designed to look like a giant cartoon, microbes show how useful they can be, making bread rise and aging cheese.

There are also interactive displays featuring images from electron microscopes, plus a world map that points up, on demand, the places where various diseases occur.

This last was news to me. I knew that because of the widespread use of antibiotics some new strains of germs have learned to resist them. I knew tuberculosis was coming back after all this time. What I did not realize was that tuberculosis kills 1.5 million people a year, or that nearly two billion people worldwide have latent TB infection, a massive potential reservoir for the disease. Cholera recently infected tens of thousands of people during a rampage through more than ten countries in East Africa. Malaria still infects 275 million people yearly, resulting in a million deaths. And all of us know about AIDS and Ebola fever, new diseases that appeared to come out of nowhere.

I remember well when Jonas Salk developed the polio vaccine in 1955; before that, summertime and swimming pools made us all nervous, and a kid could frighten his parents to death by complaining of a stiff neck. By 1967 polio cases had dropped to 1,000, and we seemed to be conquering other viral diseases, from measles

OSCAR WILLIAMS/PFIZER INC

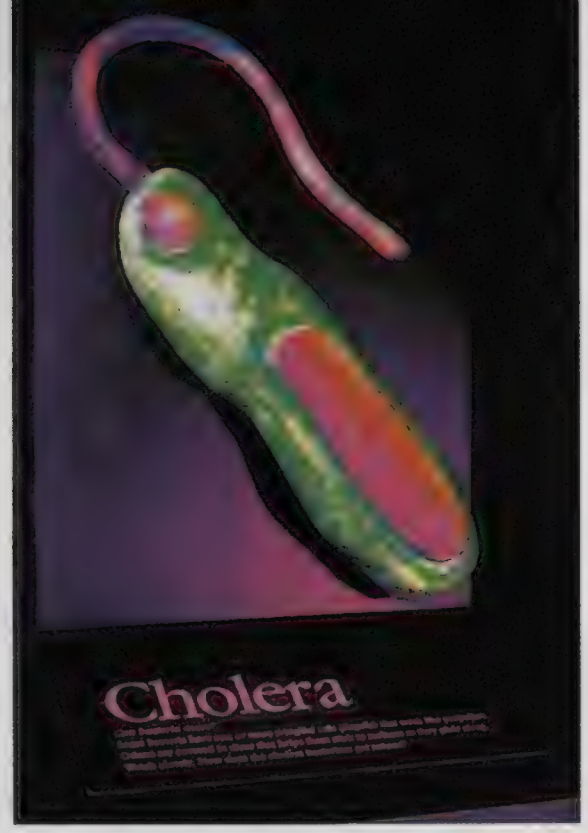
e fix-it
www.brookstone.com is an IBM e-business.
IBM e-commerce technology– the innovative tool that helped Brookstone put over 1,000 unique gift ideas online.
IBM

to influenza. Indeed, that year the Surgeon General predicted that infectious diseases were on the way to oblivion.

But the new drug-resistant microbes, plus pollution and overcrowding as the world population increased (this country's population has doubled since I was in grade school 60 years ago), have got us worried again.

Even more fascinating than the resurgence of various diseases are some of the new techniques researchers are working on to fight them, according to the folks at Pfizer Inc, the firm that sponsored the exhibition.

The first synthetic drugs were produced by copying the chemical recipes of natural antibiotics. Today, researchers must work constantly to create new forms of antibiotics because microbes have the ability to evolve and become resistant to both the natural drugs and their synthetic cousins.



A whiplike tail, called a flagellum, helps to propel the cholera bacterium.

ROB DURSTON/PFIZER INC

One technique that chemists are developing to outsmart the microbe involves treatment strategies based on genetic makeup. By studying the complete genetic blueprints of microbes, chemists can analyze the molecular processes the microbe needs to survive. Then they can produce an entirely new class of drugs—drugs targeting important processes the microbe has never had to defend before. Not surprisingly, these are being referred to as designer drugs.

Work is also being done on the link between bacteria and chronic diseases. I always thought that gastric ulcers, for example, were caused by bad diet and stress. But no, it seems that in most cases there is a bacterium that gets into the stomach lining and infects it, causing a lesion. Even atherosclerosis might be caused by yet another of these disagreeable little creatures. The latest thinking also implicates microbes in arthritis and cancer.

AIDS research has helped, as it explores the mysteries of the human immune system, for natural immunity has always been the best defense against microbes. It's rather like the

way wars have given us new surgical techniques, if nothing else.

To get back to the show: it covers a lot of ground. There is an Egyptian tomb containing a photograph of the face of Ramses V's mummy—unwrapped. One can plainly see pockmarks that indicate the virus that attacked Ramses; it apparently killed him around 1151 B.C. There is a copy of an Egyptian tablet showing the first pictorial record of polio. These diseases are not new to the human race.

In a different area we visit a catacomb below Paris, where a robotic figure wearing a beaked mask describes the Black Plague, which killed an estimated 56 million people, a third of Europe's population, in the 14th century. The mask, or something like it, was believed to protect against bubonic plague, which people thought came from poisonous gas in the earth.

As we fight off attacks by diseases we thought we had licked, new ones develop. AIDS. Ebola. Hantavirus.

Actually, it was microbes. They lived in the fleas that rode around on rats, and thus spread to virtually every household on the Continent.

An Aztec ruin in the show displays replicas of those little clay figures the Aztecs loved to make, illustrating various diseases and malformations. Even Main Street comes in for treatment with a short video describing the discovery of penicillin in 1928. (Pfizer, to give it credit, pioneered in the mass production of penicillin in World War II. The firm's labs also developed terramycin, in 1950, and tetracycline, in 1962.)

Also, we are treated to a series of holograms that present several noted microbes—Ebola and E. coli, for instance—as three-dimensional sculptures. Are they beautiful? Well . . .

Maybe, but I am reminded that infectious diseases are still the leading cause of death in this world. Even as we fight off renewed attacks by diseases we thought we had licked, new ones develop. Lyme disease. AIDS. Ebola. Legionnaires' disease. Hantavirus pulmonary syndrome, which I had never heard of but already is rampaging through 20 states.

It was Antonie van Leeuwenhoek who first noted these wee "animalcules" in the microscope that he invented in 1683. It took another two centuries before people connected them to disease.

Let us hope that the scientists of the future who see this memorable show don't wait that long to tell us about their discoveries.

THE NEW 2000 MAXIMA. *Good news for humans. Your ears will feast on the dulcet tones of a custom-tuned, 7-speaker, 200-watt Bose® audio system with CD player. Your nose will find olfactory charms in fragrant and sumptuous Seton™ leather appointments. Your mouth can imbibe lattes nestled comfortably in front or rear cup holders. As for your eyes, they will no doubt demand a second look whenever you park. And as for your sense of touch, let's just say, few things in this life feel as good as the Maxima's leather-wrapped steering wheel in your hands, its 222-horsepower V6 underfoot, and the road stretched before you. We should know, we have a sixth sense for this kind of stuff. Inquiries? Phone: 800-262-1674. Or click: nissandriven.com. The new 2000 Maxima.* **CARS LIKE IT: 0.**

©1999 Nissan North America, Inc. Nissan, the Nissan Logo, Maxima and DRIVEN are trademarks owned by or licensed to Nissan. Bose® is a registered trademark of the Bose Corporation. Maxima GLE shown with optional side-impact air bags.

SQ. FT. OF LEATHER: 45

BOSE STEREO SPEAKERS: 7

SENSES DELIGHTED: 5

NISSAN

DRIVEN.

Science Makes a Better Lighthouse Lens

BY BRUCE WATSON

STATE OF THE ART, ONE OF THE SEVEN WONDERS OF the Ancient World, the great lighthouse of Alexandria, built around 280 B.C., towered some 450 feet above Egypt's greatest harbor. At that height, it was the second-tallest structure in the world, after another of the seven—the Great Pyramid of Giza. The light within, also state of the art, was an open flame.

From that time until the 18th century, the lights that warned ships that they were approaching land improved hardly at all. Some burned coal. Others stuck with wood. Oil lamps backed by mirrors eventually offered a bit more candlepower. Still, every coastline in the world remained littered with the ribs of broken ships whose captains didn't see the lighthouse until it was too late. Then, in 1822, a frail scientist with a passion for optics made a revolutionary breakthrough. His name was Augustin Jean Fresnel.

An example of his greatest creation, a large object that looks like a crystalline beehive, may be seen inside the Hall of American Maritime Enterprise at the National Museum of American History. It towers above the museum's displays of ship models and marine artifacts. This is the Fresnel lens, not one lens really, but numerous tiers of prisms. Lenses like this one turned simple flames into beams upon which sea captains could take their bearings, avoiding risk to their ships and to the lives of their passengers.

This lens lit the way for ships approaching the harbor at Galveston, Texas, from about 1907 to 1933.

As big as it seems, by lighthouse standards the Smithsonian glass beehive is just above average, measuring nearly six feet high and more than three feet wide. It was installed in the famous Bolivar Lighthouse overlooking Galveston, Texas, sometime around 1907. This lighthouse served as sentry, and for some as sanctuary, during the deadliest hurricane in American history. The lens is visible proof that unlike the sea, light can be mastered by human ingenuity.

For thousands of years, lighthouses created their lights with open flames which, naturally, were ineffective during high winds or rain. Then, in the 1690s, the glass lantern room was invented and first installed in England's Eddystone Lighthouse. Candles placed in the lantern room's glass lantern burned more brightly and securely than the earlier open fires. Another improvement came when pieces of mirrors placed in huge, round, wooden bowls served as crude reflectors that helped to direct the light.

But throughout the 18th century, as maritime traffic increased, shipwrecks multiplied. The search was under way for a stronger, more reliable light. There is some controversy over who first placed parabolic mirrors behind flames to boost candlepower. L. Reynaud, an 18th-century chronicler and public works official, credited Swiss scientist Aimé Argand with the first installation of an apparatus using reflectors, in 1783. Argand also invented, in the 1780s, a long-burning smokeless oil lamp that removed the necessity of stoking the flames all night. But the greatest innovation was to come from Augustin Fresnel.

As a child, he was a slow learner who showed little interest in language studies or in tests of memory. By the age of 8, he could barely read. Yet his boyhood friends, for whom he studiously determined how to increase the power of popguns and bows, called him "the genius." When applied to optics, his genius proved to be real and considerable. Where others had improved existing lighthouse technology, Fresnel leapt forward by studying the behavior of light itself. His studies both advanced the understanding of the nature of light and produced the most important breakthrough in lighthouse lights in 2,000 years.

LOOK, IT'S THE NEW 2000 MAXIMA.

WANT TO SEE IT AGAIN?

Just call our 800 number or visit our web site to order an eye-opening 7-minute video featuring insights from Jerry Hirshberg, Nissan Chief Designer. You'll also receive a comprehensive 32-page brochure full of spectacular photos and packed with facts – from the Maxima's huge 32-horsepower increase to its bigger, even more luxurious interior to its sports-car-like cornering capabilities. Amazing but true.

1-800-501-2629 maxima1.com

NISSAN

DRIVEN.

© 1999 Nissan North America, Inc. Nissan, the Nissan Logo, DRIVEN and Maxima are trademarks owned by or licensed to Nissan.

Fresnel worked out a number of formulas to calculate the way light changes direction, or refracts, while passing through glass prisms. Working with some of the most advanced glassmakers of the day, he produced a combination of prism shapes that together made up a lens. The Fresnel lighthouse lens used a large lamp at the focal plane as its light source. It also contained a central panel of magnifying glasses surrounded above and below by concentric rings of prisms and mirrors, all angled to gather light, intensify it and project it outward.

The various reflector systems installed in lighthouses during the 40 years preceding the introduction of the Fresnel lens certainly had been improvements over the open fires or candles in lantern rooms. Still, they could trap only a small percentage of the light. All prior systems paled by comparison with the Fresnel lens.

The first Fresnel lens, installed in the elegant Cardovan Tower lighthouse on France's Gironde River in 1822, was visible to the horizon, more than 20 miles away. Sailors had long romanticized lighthouses. Now scientists could rhapsodize, too. "Nothing can be more beautiful than an entire apparatus for a fixed light," one engineer said of Fresnel's device. "I know of no work of art more beautifully creditable to the boldness, ardor, intelligence, and zeal of the artist."

One of the strongest lights on the Oregon coast, the Heceta Head Lighthouse casts a Fresnel-lens-focused, 2,000,000-candlepower beam out into the Pacific Ocean.

Fresnel lenses soon shone along the ragged coastlines of Europe, but surprisingly, America was slower to see the light. As mariners came to depend on Europe's powerful new lights, they complained bitterly about the puny lamps lighting America's coasts. Despite the clear superiority of Fresnel lenses, the parsimonious bureaucrat in charge of federal lighthouses, Stephen Pleasanton, considered the cost prohibitive. Finally, the uproar became so great that in 1838 Congress launched an investigation. It was not until then that Congress coughed up the cash to import a few Fresnel lenses. The first were installed in 1841 inside the two towers at Navesink Lighthouse, overlooking the approach to New York Harbor.

Only after 1852, when the United States created a Lighthouse Board made up of eminent scientists and mariners, including Joseph Henry of the Smithsonian and Alexander Bache of the U. S. Coast Survey, did the great lenses really begin to light America's coastline. By the Civil War, nearly all lighthouses in the United States had Fresnel lenses. It was shortly after the Civil War, however, before a beehive of prisms first shone from the Bolivar Light watching over Galveston. A Fresnel lens, similar to the one on display at NMAH, was still in use there in September 1900, when waves from the Gulf of Mexico began pounding the coast.

Late in the morning of September 7, the U.S. Weather Station in Galveston learned by telegraph that a hurricane had just ripped across Florida and was somewhere over the Gulf. The next day, a telegrapher wired Washington, D.C. that Galveston was going under. Thousands died. Among the survivors were 125 people who found safety in the lighthouse. Keeper H. C. Claiborne exhausted a month's supply of food feeding the crowd. When the tower swayed in the wind, disabling the machinery that rotated the lens, Claiborne turned the lens by hand crank and kept the Bolivar Light shining through that terrible night.

With time, Galveston recovered. The Bolivar Light served the city until 1933, then was replaced by another light on the south side of Galveston. The museum's lens served through the Galveston hurricane of 1915, then retired with the lighthouse and was stored by the U.S. Department of the Interior until it was transferred to the Smithsonian in 1976. By then, Augustin Jean Fresnel, who lived only a short while after inventing his great device, had been dead for nearly a century and a half. Along with the lens, Fresnel left behind his theories of light, which form the basis of modern optics. Today, the principle behind the Fresnel lens is used in the headlights of cars and in the flashing lights on police and emergency vehicles. And in a few older lighthouses around the country, and the world, Fresnel's elegant beehives still shine.

Is it just forgetfulness...

- Memory loss
- Asking repeated questions
- Trouble using words

When signs like these begin to affect everyday life, they may not be a part of normal aging. They may be signs of Alzheimer's disease, an incurable, progressive illness that robs patients and their families of a lifetime of memories.

Today, however, the outlook for many is becoming more hopeful. ARICEPT® is a clinically proven, once-a-day prescription medicine available to treat symptoms in patients with mild to moderate Alzheimer's disease. Already, over 625,000 patients in the United States have begun ARICEPT® therapy.

ARICEPT® is well tolerated, but some people do experience side effects like nausea, diarrhea, insomnia, vomiting, muscle cramps, fatigue, and loss of appetite. In clinical studies, these effects were generally mild, temporary, and went away with continued ARICEPT® use; 2% of people taking ARICEPT® experienced fainting.

Only a doctor can evaluate symptoms such as forgetfulness and diagnose Alzheimer's disease. Speak to a doctor *today* about the benefits of ARICEPT® in treating Alzheimer's disease.

ONCE-A-DAY
ARICEPT®
(donepezil HCl)
5-MG AND 10-MG TABLETS

TODAY'S TREATMENT FOR ALZHEIMER'S DISEASE

To learn more, call toll-free today.

1·888·999·9616 ext. 94

Please see additional important product information on accompanying page.

People at risk for ulcers should inform their doctor.

ONCE-A-DAY
ARICEPT® (donepezil HCl) 5-MG AND 10-MG TABLETS
TODAY'S TREATMENT FOR ALZHEIMER'S DISEASE

ARICEPT® (Donepezil Hydrochloride Tablets)
Brief Summary—see package insert for full prescribing information. **INDICATIONS AND USAGE** ARICEPT® is indicated for the treatment of mild to moderate dementia of the Alzheimer's type. **CONTRAINDICATIONS** ARICEPT® is contraindicated in patients with known hypersensitivity to donepezil hydrochloride or to piperidine derivatives. **WARNINGS** ***Anesthesia:*** ARICEPT®, as a cholinesterase inhibitor, is likely to exaggerate succinylcholine-type muscle relaxation during anesthesia. ***Cardiovascular Conditions:*** Because of their pharmacological action, cholinesterase inhibitors may have vagotonic effects on heart rate (eg, bradycardia). The potential for this action may be particularly important to patients with "sick sinus syndrome" or other supraventricular cardiac conduction conditions. Syncopal episodes have been reported in association with the use of ARICEPT®. ***Gastrointestinal Conditions:*** Through their primary action, cholinesterase inhibitors may be expected to increase gastric acid secretion due to increased cholinergic activity. Therefore, patients should be monitored closely for symptoms of active or occult gastrointestinal bleeding, especially those at increased risk for developing ulcers, eg, those with a history of ulcer disease or those receiving concurrent nonsteroidal anti-inflammatory drugs (NSAIDS). Clinical studies of ARICEPT® have shown no increase, relative to placebo, in the incidence of either peptic ulcer disease or gastrointestinal bleeding. ARICEPT®, as a predictable consequence of its pharmacological properties, has been shown to produce diarrhea, nausea, and vomiting. These effects, when they occur, appear more frequently with the 10 mg/day dose than with the 5 mg/day dose. In most cases, these effects have been mild and transient, sometimes lasting one to three weeks, and have resolved during continued use of ARICEPT . ***Genitourinary:*** Although not observed in clinical trials of ARICEPT®, cholinomimetics may cause bladder outflow obstruction. ***Neurological Conditions:*** Seizures: Cholinomimetics are believed to have some potential to cause generalized convulsions. However, seizure activity also may be a manifestation of Alzheimer's Disease. ***Pulmonary Conditions:*** Because of their cholinomimetic actions, cholinesterase inhibitors should be prescribed with care to patients with a history of asthma or obstructive pulmonary disease. **PRECAUTIONS Drug-Drug Interactions** ***Drugs Highly Bound to Plasma Proteins:*** Drug displacement studies have been performed *in vitro* between this highly bound drug (96%) and other drugs such as furosemide, digoxin, and warfarin. ARICEPT® at concentrations of 0.3-10 µg/mL did not affect the binding of furosemide (5 µg/mL), digoxin (2 ng/mL), and warfarin (3 µg/mL) to human albumin. Similarly, the binding of ARICEPT® to human albumin was not affected by furosemide, digoxin and warfarin. ***Effect of ARICEPT® on the Metabolism of Other Drugs:*** No *in vivo* clinical trials have investigated the effect of ARICEPT® on the clearance of drugs metabolized by CYP 3A4 (eg, cisapride, terfenadine) or by CYP 2D6 (eg, imipramine). However, *in vitro* studies show a low rate of binding to these enzymes (mean K_i about 50 -130 µM), that, given the therapeutic plasma concentrations of donepezil (164 nM), indicates little likelihood of interference. Whether ARICEPT® has any potential for enzyme induction is not known. Formal pharmacokinetic studies evaluated the potential of ARICEPT® for interaction with theophylline, cimetidine, warfarin and digoxin. No significant effects on the pharmacokinetics of these drugs were observed. ***Effect of Other Drugs on the Metabolism of ARICEPT®:*** Ketoconazole and quinidine, inhibitors of CYP450, 3A4 and 2D6, respectively, inhibit donepezil metabolism *in vitro*. Whether there is a clinical effect of these inhibitors is not known. Inducers of CYP 2D6 and CYP 3A4 (eg, phenytoin, carbamazepine, dexamethasone, rifampin, and phenobarbital) could increase the rate of elimination of ARICEPT®. Formal pharmacokinetic studies demonstrated that the metabolism of ARICEPT® is not significantly affected by concurrent administration of digoxin or cimetidine. ***Use with Anticholinergics:*** Because of their mechanism of action, cholinesterase inhibitors have the potential to interfere with the activity of anticholinergic medications. ***Use with Cholinomimetics and Other Cholinesterase Inhibitors:*** A synergistic effect may be expected when cholinesterase inhibitors are given concurrently with succinylcholine, similar neuromuscular blocking agents or cholinergic agonists such as bethanechol. **Carcinogenesis, Mutagenesis, Impairment of Fertility** Carcinogenicity studies of donepezil have not been completed. Donepezil was not mutagenic in the Ames reverse mutation assay in bacteria. In the chromosome aberration test in cultures of Chinese hamster lung (CHL) cells, some clastogenic effects were observed. Donepezil was not clastogenic in the *in vivo* mouse micronucleus test. Donepezil had no effect on fertility in rats at doses up to 10 mg/kg/day (approximately 8 times the maximum recommended human dose on a mg/m² basis). **Pregnancy** *Pregnancy Category C:* Teratology studies conducted in pregnant rats at doses up to 16 mg/kg/day (approximately 13 times the maximum recommended human dose on a mg/m² basis) and in pregnant rabbits at doses up to 10 mg/kg/day (approximately 16 times the maximum recommended human dose on a mg/m² basis) did not disclose any evidence for a teratogenic potential of donepezil. However, in a study in which pregnant rats were given up to 10 mg/kg/day (approximately 8 times the maximum recommended human dose on a mg/m² basis) from day 17 of gestation through day 20 postpartum, there was a slight increase in still births and a slight decrease in pup survival through day 4 postpartum at this dose; the next lower dose tested was 3 mg/kg/day. There are no adequate or well-controlled studies in pregnant women. ARICEPT® should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus. **Nursing Mothers** It is not known whether donepezil is excreted in human breast milk. ARICEPT® has no indication for use in nursing mothers. **Pediatric Use** There are no adequate and well-controlled trials to document the safety and efficacy of ARICEPT® in any illness occurring in children. **ADVERSE REACTIONS Adverse Events Leading to Discontinuation** The rates of discontinuation from controlled clinical trials of ARICEPT® due to adverse events for the ARICEPT® 5 mg/day treatment groups were comparable to those of placebo-treatment groups at approximately 5%. The rate of discontinuation of patients who received 7-day escalations from 5 mg/day to 10 mg/day, was higher at 13%. The most common adverse events leading to discontinuation, defined as those occurring in at least 2% of patients and at twice the incidence seen in placebo patients were nausea (1% [5 mg] and 3% [10 mg] vs 1% [placebo]), diarrhea (<1% [5 mg] and 3% [10 mg] vs 0% [placebo]), and vomiting (<1% [5 mg] and 2% [10 mg] vs <1% [placebo]). **Most Frequent Adverse Clinical Events Seen in Association with the Use of ARICEPT®** The most common adverse events, defined as those occurring at a frequency of at least 5% in patients receiving 10 mg/day and twice the placebo rate, are largely predicted by ARICEPT®'s cholinomimetic effects. These include nausea, diarrhea, insomnia, vomiting, muscle cramp, fatigue, and anorexia. These adverse events were often of mild intensity and transient, resolving during continued ARICEPT® treatment without the need for dose modification. There is evidence to suggest that the frequency of these common adverse events may be affected by the rate of titration. An open-label study was conducted with 269 patients who received placebo in the 15- and 30-week studies. These patients were titrated to a dose of 10 mg/day over a 6-week period. The rates of common adverse events were lower than those seen in patients titrated to 10 mg/day over one week in the controlled clinical trials and were comparable to those seen in patients on 5 mg/day. See Table 1 for a comparison of the most common adverse events following one week and six week titration regimens. **Adverse Events Reported in Controlled Trials** The events cited reflect experience gained under closely monitored conditions of clinical trials in a highly selected patient population. In actual clinical practice or in other clinical trials, these frequency estimates may not apply, as the conditions of use, reporting behavior, and the kinds of patients treated may differ. Table 2 lists treatment emergent signs and symptoms that were reported in at least 2% of patients in placebo-controlled trials who received ARICEPT® and for which the rate of occurrence was greater for ARICEPT® assigned than placebo assigned patients. In general, adverse events occurred more frequently in female patients and with advancing age. **Other Adverse Events Observed During Clinical Trials** ARICEPT® has been administered to over 1700 individuals during clinical trials worldwide. Approximately 1200 of these patients have been treated for at least 3 months and more than 1000 patients have been treated for at least 6 months. Controlled and uncontrolled trials in the United States included approximately 900 patients. In regards to the highest dose of 10 mg/day, this population includes 650 patients treated for 3 months, 475 patients treated for 6 months and 116 patients treated for over 1 year. The range of patient exposure is from 1 to 1214 days. Treatment emergent signs and symptoms that occurred during 3 controlled clinical trials and two open-label trials in the United States were recorded as adverse events by the clinical investigators using terminology of their own choosing. To provide an overall estimate of the proportion of individuals having similar types of events, the events were grouped into a smaller number of standardized categories using a modified COSTART dictionary and event frequencies were calculated across all studies. These categories are used in the listing below. The frequencies represent the proportion of 900 patients from these trials who experienced that event while receiving ARICEPT®. All adverse events occurring at least twice are included, except for those already listed in Tables 1 or 2, COSTART terms too general to be informative, or events less likely to be drug caused. Events are classified by body system and listed using the following definitions: *frequent adverse events*—those occurring in at least 1/100 patients; *infrequent adverse events*—those occurring in 1/100 to 1/1000 patients. These adverse events are not necessarily related to ARICEPT® treatment and in most cases were observed at a similar frequency in placebo-treated patients in the controlled studies. No important additional adverse events were seen in studies conducted outside the United States. **Body as a Whole:** *Frequent:* influenza, chest pain, toothache; *Infrequent:* fever, edema face, periorbital edema, hernia hiatal, abscess, cellulitis, chills, generalized coldness, head fullness, listlessness. **Cardiovascular System:** *Frequent:* hypertension, vasodilation, atrial fibrillation, hot flashes, hypotension; *Infrequent:* angina pectoris, postural hypotension, myocardial infarction, AV block (first degree), congestive heart failure, arteritis, bradycardia, peripheral vascular disease, supraventricular tachycardia, deep vein thrombosis. **Digestive System:** *Frequent:* fecal incontinence, gastrointestinal bleeding, bloating, epigastric pain; *Infrequent:* eructation, gingivitis, increased appetite, flatulence, periodontal abscess, cholelithiasis, diverticulitis, drooling, dry mouth, fever sore, gastritis, irritable colon, tongue edema, epigastric distress, gastroenteritis, increased transaminases, hemorrhoids, ileus, increased thirst, jaundice, melena, polydypsia, duodenal ulcer, stomach ulcer. **Endocrine System:** *Infrequent:* diabetes mellitus, goiter. **Hemic and Lymphatic System:** *Infrequent:* anemia, thrombocythemia, thrombocytopenia, eosinophilia, erythrocytopenia. **Metabolic and Nutritional Disorders:** *Frequent:* dehydration; *Infrequent:* gout, hypokalemia, increased creatine kinase, hyperglycemia, weight increase, increased lactate dehydrogenase. **Musculoskeletal System:** *Frequent:* bone fracture; *Infrequent:* muscle weakness, muscle fasciculation. **Nervous System:** *Frequent:* delusions, tremor, irritability, paresthesia, aggression, vertigo, ataxia, increased libido, restlessness, abnormal crying, nervousness, aphasia; *Infrequent:* cerebrovascular accident, intracranial hemorrhage, transient ischemic attack, emotional lability, neuralgia, coldness (localized), muscle spasm, dysphoria, gait abnormality, hypertonia, hypokinesia, neurodermatitis, numbness (localized), paranoia, dysarthria, dysphasia, hostility, decreased libido, melancholia, emotional withdrawal, nystagmus, pacing. **Respiratory System:** *Frequent:* dyspnea, sore throat, bronchitis; *Infrequent:* epistaxis, postnasal drip, pneumonia, hyperventilation, pulmonary congestion, wheezing, hypoxia, pharyngitis, pleurisy, pulmonary collapse, sleep apnea, snoring. **Skin and Appendages:** *Frequent:* pruritus; diaphoresis, urticaria; *Infrequent:* dermatitis, erythema, skin discoloration, hyperkeratosis, alopecia, fungal dermatitis, herpes zoster, hirsutism, skin striae, night sweats, skin ulcer. **Special Senses:** *Frequent:* cataract, eye irritation, vision blurred; *Infrequent:* dry eyes, glaucoma, earache, tinnitus, blepharitis, decreased hearing, retinal hemorrhage, otitis externa, otitis media, bad taste, conjunctival hemorrhage, ear buzzing, motion sickness, spots before eyes. **Urogenital System:** *Frequent:* urinary incontinence, nocturia; *Infrequent:* dysuria, hematuria, urinary urgency, metrorrhagia, cystitis, enuresis, prostate hypertrophy, pyelonephritis, inability to empty bladder, breast fibroadenosis, fibrocystic breast, mastitis, pyuria, renal failure, vaginitis. **Postintroduction Reports** Voluntary reports of adverse events temporally associated with ARICEPT® that have been received since market introduction that are not listed above, and that there is inadequate data to determine the causal relationship with the drug include the following: abdominal pain, agitation, cholecystitis, confusion, convulsions, hallucinations, heart block, hemolytic anemia, hyponatremia, pancreatitis, and rash. **OVERDOSAGE Because strategies for the management of overdose are continually evolving, it is advisable to contact a Poison Control Center to determine the latest recommendations for the management of an overdose of any drug.** As in any case of overdose, general supportive measures should be utilized. Overdosage with cholinesterase inhibitors can result in cholinergic crisis characterized by severe nausea, vomiting, salivation, sweating, bradycardia, hypotension, respiratory depression, collapse and convulsions. Increasing muscle weakness is a possibility and may result in death if respiratory muscles are involved. Tertiary anticholinergics such as atropine may be used as an antidote for ARICEPT® overdosage. Intravenous atropine sulfate titrated to effect is recommended: an initial dose of 1.0 to 2.0 mg IV with subsequent doses based upon clinical response. Atypical responses in blood pressure and heart rate have been reported with other cholinomimetics when co-administered with quaternary anticholinergics such as glycopyrrolate. It is not known whether ARICEPT® and/or its metabolites can be removed by dialysis (hemodialysis, peritoneal dialysis, or hemofiltration). Dose-related signs of toxicity in animals included reduced spontaneous movement, prone position, staggering gait, lacrimation, clonic convulsions, depressed respiration, salivation, miosis, tremors, fasciculation and lower body surface temperature. **DOSAGE AND ADMINISTRATION** The dosages of ARICEPT® shown to be effective in controlled clinical trials are 5 mg and 10 mg administered once per day. Controlled clinical trials indicate that the 10 mg dose, with a one week titration, is likely to be associated with a higher incidence of cholinergic adverse events than the 5 mg dose. Because steady state is not achieved for 15 days and because the incidence of such effects may be influenced by the rate of dose escalation, treatment with a dose of 10 mg should not be contemplated until patients have been on a daily dose of 5 mg for 4 to 6 weeks. Whether or not to employ a dose of 10 mg is a matter of prescriber and patient preference. ARICEPT® should be taken in the evening, just prior to retiring, and may be taken with or without food.

Table 1. Comparison of Rates of Adverse Events in Patients Titrated to 10 mg/day Over 1 and 6 Weeks

	No titration		One-week titration	Six-week titration
Adverse Event	Placebo (n=315)	5 mg/day (n=311)	10 mg/day (n=315)	10 mg/day (n=269)
Nausea	6%	5%	19%	6%
Diarrhea	5%	8%	15%	9%
Insomnia	6%	6%	14%	6%
Fatigue	3%	4%	8%	3%
Vomiting	3%	3%	8%	5%
Muscle Cramps	2%	6%	8%	3%
Anorexia	2%	3%	7%	3%

Table 2. Adverse Events Reported in Controlled Clinical Trials in at Least 2% of Patients Receiving ARICEPT® and at a Higher Frequency Than Placebo-treated Patients

Body System/Adverse Event	Placebo (n=355)	ARICEPT® (n=747)
Percent of Patients With Any Adverse Event	72	74
Body as a Whole		
Headache	9	10
Pain, Various Locations	8	9
Accident	6	7
Fatigue	3	5
Cardiovascular System		
Syncope	1	2
Digestive System		
Nausea	6	11
Diarrhea	5	10
Vomiting	3	5
Anorexia	2	4
Hemic and Lymphatic System		
Ecchymosis	3	4
Metabolic and Nutritional Systems		
Weight Decrease	1	3
Musculoskeletal System		
Muscle Cramps	2	6
Arthritis	1	2
Nervous System		
Insomnia	6	9
Dizziness	6	8
Depression	<1	3
Abnormal Dreams	0	3
Somnolence	<1	2
Urogenital System		
Frequent Urination	1	2

Revised September, 1998

Eisai Inc.
Teaneck, NJ 07666
MADE IN USA
Pfizer U.S. Pharmaceuticals
New York, NY 10017

EL049A99

© 1999, Eisai Inc. and Pfizer Inc

Printed in USA/May1999

KARL AMMANN

Life-size Not Large Enough?

SMITHSONIAN HIGHLIGHTS

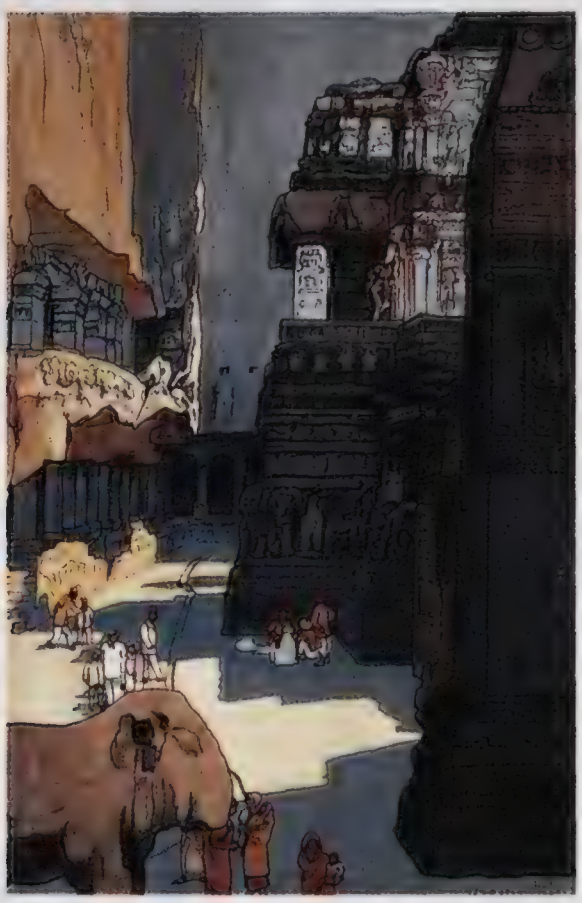
YOU LIKE THINGS REALLY, REALLY BIG? IN *Africa's Elephant Kingdom*, a single animal often fills the screen of the new IMAX theater at the National Museum of Natural History. And that screen is 66 feet tall and 90 feet wide, one of the world's largest. The new theater also features state-of-the-art IMAX technology. It can project high-definition film—48 frames per second versus 24—for greater clarity of detail. A highly reflective, metallic-coated screen will maximize the effect of 3-D IMAX movies, and the 12,000-watt audio system provides six channels of high-fidelity, surround sound. *Africa's Elephant Kingdom*, a new 2-D film, observes at close range a matriarch and her large family, including newborns, as they troop across the sweeping landscapes beneath Mount Kilimanjaro in search of food and water. *Mysteries of Egypt*, another new 2-D film, will also be shown, beginning in September. The theater's first 3-D film, *Galapagos*, will make its world premiere there in October. In addition to seeing the likes of giant land tortoises, marine iguanas and blue-footed boobies, viewers will follow scientists as they explore deep in the ocean and find the undersea creatures of the Galápagos to be as unique as those on land. The theater is part of NMNH's new Discovery Center, which also offers a 600-seat café and an elephantine, elaborate museum shop. For showtimes and other information, call 202-633-7400 or visit www.nmnh.si.edu/museum/DiscoveryCenter. —*Bruce Hathaway*

SMITHSONIAN HIGHLIGHTS

Asian Journey

PRINTS BY YOSHIDA HIROSHI

In 1930 Yoshida Hiroshi, a prominent Japanese printer and print artist, set sail for India and Southeast Asia. After returning to Japan, he made 32 prints based on his travels. Captured by the intense quality of southern



Kailasa Temple Ellora depicts the huge Indian temple, carved from solid rock.

light so different from the diffuse illumination of his homeland, Yoshida used the highly refined techniques he had developed in the 1920s to imbue the prints with the delicate, translucent tonalities of watercolor paintings. All the prints, including six images of the Taj Mahal, are on view at the Sackler Gallery through October 17.

Man of Science

"FRANKLIN AND HIS FRIENDS"

Ben Franklin was fascinated by science and helped define the "man of science" as an ideal figure in 18th-century America. On view at the National Portrait Gallery through September 6 are 35 portraits of Franklin and other scientists from his time, accompanied by scientific objects that can be seen in the paintings—including botanical drawings, microscopes and telescopes.

Smithsonian Website

WWW.SMITHSONIANMAG.SI.EDU

Another place to learn about the exhibitions, events, publications, programs and activities of the Smithsonian is our Website. There you will find the *Highlights Calendar* with links to the many pages of the Smithsonian Institution Website.

Exhibitions, Events

ART NIGHT ON THE MALL

South Asian dance performances, music from Malawi, modern art from South Africa, films, a variety of children's activities and alfresco dining are among the offerings at Art Night this year. Through September 2, the Arthur M. Sackler Gallery, the Freer Gallery of Art, the Hirshhorn Museum & Sculpture Garden and the National Museum of African Art will be open Thursday evenings until 8.

SUMMER SCIENCE NIGHTS MICROBES AND MORE

Through September 6, the International Gallery, the National Museum of Natural History and the National Museum of American History will be open late every night until 7:30, and the National Air and Space Museum will be open from 9:30 A.M. until 6 P.M. daily. "Microbes," an elaborate, interactive children's exhibition, is featured at the International Gallery (see "Around the Mall," page 24).

Group of Ainu is featured in "Ainu: Spirit of a Northern People" at NMNH.

ENID A. HAUPT GARDEN

Under the Sun: An Outdoor Exhibition of Light (through September 6) Created by the Cooper-Hewitt, National Design Museum, an exploration of solar technology.

NATIONAL MUSEUM OF AFRICAN ART

Hats Off! A Salute to African Headwear (through December 26)
Claiming Art/Reclaiming Space: Post-Apartheid Art from South Africa (through September 26)

ARTS AND INDUSTRIES BUILDING

From Bento to Mixed Plate: Americans of Japanese Ancestry in Multicultural Hawaii (through November 30) Personal artifacts, photographs and a small 19th-century locomotive from a sugar plantation. For a limited time, from 11 A.M. to 2 P.M., dishes that reflect the many cultures of contemporary Hawaii—such as adobo chicken, teriyaki beef, kalua pig and kimchee—will be sold from a lunch wagon.
Revue Noire: Africa by Africans A century of African photography.
Discovery Theater Live theater for youngsters. Call 202-357-1500 (voice or TTY) weekdays, 8 A.M.-4 P.M.

TOP: TAKEKI FUJITO; BOTTOM: ARTHUR M. SACKLER GALLERY

TO UNLOCK THE SECRETS OF THE OCEAN,
DR. ROBERT BALLARD USES THE MOST SOPHISTICATED
UNDERWATER EQUIPMENT.

INCLUDING HIS ROLEX SUBMARINER.

Dr. Ballard, during an expedition in the Pacific, atop the ATV (Advanced Tethered Vehicle)

Using remote controlled vehicles and submarines, Dr. Ballard has found, among others, the *Titanic*, the *Bismarck*, and ancient shipwrecks. His favorite piece of oceanographic equipment, however, is his Rolex Submariner.

ROLEX

Rolex Submariner Officially Certified Swiss Chronometer.
For the name and location of an Official Rolex Jeweler near you, please call 1-800-36ROLEX. Rolex, ♛, Oyster Perpetual and Submariner are trademarks.

COOPER-HEWITT, NATIONAL DESIGN MUSEUM
[NEW YORK CITY]

El Nuevo Mundo: The Landscape of Latino Los Angeles (through September 5) Photographs by documentarian Camilo José Vergara.

NATIONAL MUSEUM OF AMERICAN HISTORY

Preserving the Star-Spangled Banner: The Flag that Inspired the National Anthem Visitors can see work being done on the flag as part of the three-year-long conservation process.

Study for the Muses (Hydra Version) by Brice Marden is at the Hirshhorn Museum.

Photographing History: Fred J. Maroon and the Nixon Years, 1970-1974 (through December 5) Pictures of the Nixon Presidency.
Closing: Life and Death of an American Factory, Photographs by Bill Bamberger (through October 10)

NATIONAL MUSEUM OF NATURAL HISTORY

Ainu: Spirit of a Northern People An unprecedented, in-depth look at the 10,000-year-old culture of the Ainu, the indigenous people of northern Japan.

HIRSHHORN MUSEUM & SCULPTURE GARDEN

Brice Marden, Work of the 1990s: Paintings, Drawings, and Prints (through September 6) Bright, intertwining bands of color in some 40 works.
Directions—Sam Taylor-Wood (through October 17) A London video artist in her first U.S. museum show.

NATIONAL AIR AND SPACE MUSEUM

And a Star to Steer Her By A planetarium show (fee) and an accompanying exhibition, *GPS: A New Constellation*, explore the history of navigation.

NATIONAL POSTAL MUSEUM

The Graceful Envelope (through October 31) Seventy-five winners in the annual envelope design competition. *Mayhem By Mail* Explores three categories of crime investigated by U.S. Postal Inspectors.

ARTHUR M. SACKLER GALLERY

Devi: The Great Goddess (through September 6) See SMITHSONIAN, June 1999. *Behind the Himalayas: Paintings of Mustang* (through September 26)

FREER GALLERY OF ART

A Breath of Spring Masterful 14th-century Chinese handscroll painting on the subject of the flowering plum.
Shades of Green and Blue: Chinese Celadon Ceramics Forty-four works illustrate the development of the gray-green glaze.

NATIONAL PORTRAIT GALLERY

Picturing Hemingway: A Writer in His Time (through November 7) See "Smithsonian Highlights," SMITHSONIAN, July 1999.

This 900-year-old planter is in "Shades of Green and Blue" at the Freer Gallery.

Edward Sorel: Unauthorized Portraits (through November 7) Biting satires and witty spoofs of celebrities.
Hans Namuth: Portraits (through September 6) Photographs of more than 200 artists, writers and musicians.

NATIONAL MUSEUM OF AMERICAN ART

Woodcuts by Hiratsuka (through September 12) Works by Unichi Hiratsuka.
Abbott Thayer: The Nature of Art (through September 6) Works by the artist who helped adapt camouflage for warfare.

SMITHSONIAN INSTITUTION TRAVELING EXHIBITION SERVICE

"This Land is Your Land: the Life and Legacy of Woody Guthrie" is on view at the Autry Museum of Western Heritage in Los Angeles through September 26. A listing of other SITES exhibitions is available at www.si.edu/sites.

Planning a Smithsonian Visit?

THE CASTLE—INFORMATION CENTER

Begin your visit at the Smithsonian Information Center's Associates' Reception Desk—open 9 A.M.-4 P.M. daily—in the Castle. Special materials and information on exhibitions, activities and dining await you there. Learn what's new at the Smithsonian and other capital attractions—with brochures, videos, touch screens, electronic maps and more. Smithsonian museums are generally open 10 A.M.-5:30 P.M. daily, except December 25. Summer hours for the grounds at the National Zoo are 6 A.M.-8 P.M. daily. To receive a free Associates' planning packet, write to Smithsonian Information, Smithsonian Institution, Washington, D.C. 20560-0010, or send your request via e-mail to info@info.si.edu, or call 202-357-2700 (voice) or 202-357-1729 (TTY), 9 A.M.-5 P.M., Monday-Friday; 10 A.M.-4 P.M., Saturday-Sunday. Note: Parking on the Mall is limited; Metrorail (subway) is convenient to most museums.

TOP: NEIL GREENTREE; BOTTOM: PRIVATE COLLECTION

The ABC's of Safety: Air bags. Buckle up. Children in back. Legacy® GT Wagon shown with optional equipment.

Our unique All-Wheel Driving System automatically transfers power from the wheels that slip to the wheels that grip.

Our engineers have given every Subaru a mind of its own. It's called the All-Wheel Driving System. A combination of three unique components, all working together to react to your every move. The horizontally opposed boxer engine provides a low center of gravity for better control. The four-wheel fully independent suspension helps smooth out even the roughest of roads. And the full-time All-Wheel Driving System automatically transfers power from the wheels that slip to the wheels that grip for maximum traction and handling in almost any type of weather. So to get a vehicle that's always thinking, drop by your Subaru dealer for a test-drive, visit www.subaru.com or call 1-800-WANT-AWD. We'll be anxious to see your reaction.

SUBARU

The Beauty of All-Wheel Drive®

Charting One School's

BY RICHARD & JOYCE WOLKOMIR ◆ PHOTOGRAPHS BY WAYNE SORCE

Challenging Course

AS THE PRINCIPAL OF MONTPELIER HIGH, CHARLIE PHILLIPS HAS WORKED TO MAKE HIS SCHOOL A PLACE WHERE TEACHERS AND ADMINISTRATORS LISTEN TO KIDS

"WHY DOES IT MAKE SENSE TO do this?" Charlie Phillips asks. He asks gently.

The boy hopes to transfer to this high school. He tugs at the brim of his New York Yankees cap. "Where I am now, it's open classrooms, way too loud," he says. "I can't focus."

His mother leans forward in her chair. "His grades have slipped," she says.

"I have two sides to me," the boy says. "One really wants to get ahead and succeed, and the other side just wants to goof off."

"It's good to have an objective view of yourself," Charlie says.

Everyone calls him Charlie. He has spent 34 years here at Montpelier High School, in the Vermont capital. English teacher. Athletic director. Now principal. His beard has

In the main lobby, crowded with students, Phillips gives senior Kevin Schelley an affectionate head squeeze.

During lunchtime, counselor Chip Keinath oversees one of his informal support and discussion groups.

grown gray here inside these walls.

"You know, changing schools is tough," he says. "But activities are good for meeting people. Do you have any special interests?"

"I don't know if you have a golf team . . . "

"We do," the principal says. "And are you interested in track?" The boy points to his belly: "I carry a little too much right here." Charlie laughs. "Me, too."

This school is not big, not tiny, not rich, not poor. In many ways, it is merely typical. But Charlie Phillips loves this school of 500 students.

"Can I wear my Yankees hat?" the boy says. "I've *got* to wear my Yankees hat!" Impulsively, Charlie pretends to stamp the back of the boy's hand. "That's my stamp of approval!" he says. "Welcome to Montpelier High School."

Laser, a black labrador wearing a guide-dog harness, goes first into

This school is not big, not tiny, not rich, not poor. In many ways, it is merely typical.

the empty classroom. Esther Shiner helps her mother into the unfamiliar room, holding her arm. Esther's father finds his own way.

"My history?" Esther says softly. She is a small, slender girl, pretty, wearing white shorts and a blue sweater, her brown hair pulled back in a ponytail. "Well, I've lived my whole life here in Montpelier . . . "

It is intimidating, entering as a freshman. Classes will not start for several days, but the Shiners are meeting with mathematics teacher Susan Beem, who will be Esther's teacher-adviser. "Have you ever done anything you just thought was great?" Susan asks.

Esther shrugs. "Esther is shy," her mother says. "But she is a real animal lover." Esther brightens. "I took a photography class and I had a picture in the newspaper of Odette, my dog," she says. "We were raising Odette to be a guide dog, but she went to guide-dog school and she flunked!" "Esther plays the piano," her mother says. "And this will be her seventh year playing the recorder." "For the past three summers I've been flying to Michigan by myself to visit a friend," Esther offers, and then looks abashed when the adviser asks if she writes to her friend. "I'm kind of not good at that," Esther says, nearly whispering. "Esther writes well," her mother says. "But she doesn't like to do it."

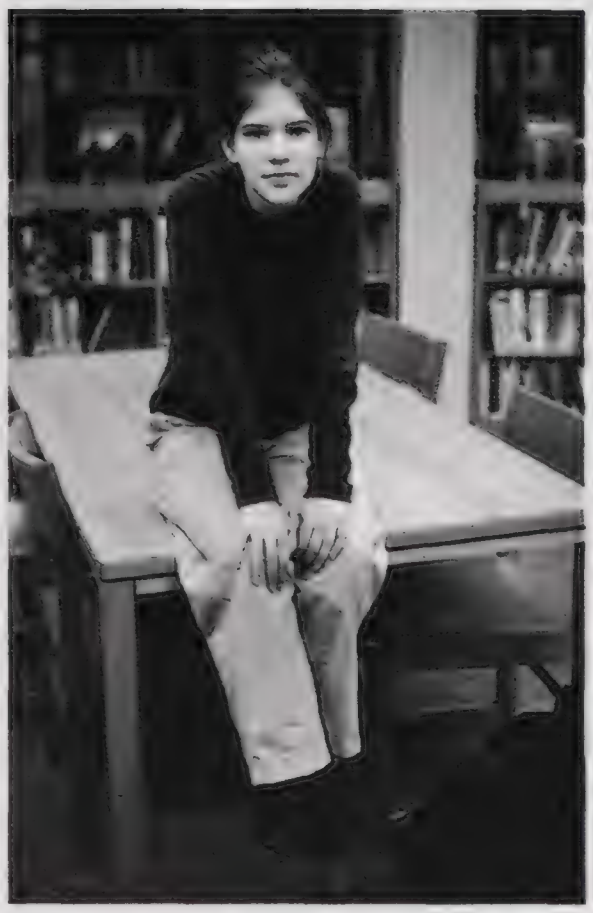
They are working, Susan Beem explains, on the McGill Action Planning System, or MAPS, a way for Esther to assess herself. It is step one in her Personal Learning Plan, which

Esther and her adviser and her parents will develop together, the master plan for Esther's high school career—regular subjects, extracurricular activities, self-study courses. Eventually, Esther may also design Community Based Learning courses for herself, with local experts volunteering as her teachers. "A veterinarian, for instance," the adviser suggests.

"To communicate with us, e-mail works best," Esther's father says. Their home computers, he explains, convert written messages, which the two adult Shiners cannot see, into spoken words.

What are her personal strengths? "I don't know . . . " Esther hesitates.

"She likes to read," her father says. Favorite course? Spanish. She likes swimming, skiing. Dislikes? "Being asked to do something repeatedly." Dreams? College, although she does not know what to study. Fears? "Presenting things," Esther says. "Her teachers say she doesn't answer questions unless she's called on," her mother explains. "Then she gives good answers," her father says. "I'm a little nervous about starting school here," Esther says.



The faces of Montpelier High include, from top: freshman Esther Shiner; sophomore Brian Friend, here, practicing bass guitar; and junior Tim Bentley.

PRINCIPAL PREOCCUPATIONS

OUTSIDE CHARLIE PHILLIPS' OFFICE window, the athletic fields have blossomed with green "Solons" jerseys—boys' soccer, girls' soccer, field hockey, football. It gives Charlie a sense of well-being, the sight of these fields and kids at play.

In September of 1997, he recalls, four students driving drunkenly home from a backwoods keg party careened off a country road. Two died. It was a dark year. Remembering, Charlie's eyes well up.

He is preoccupied by other dark concerns, too. Because of the tragedy of youth violence that has engulfed schools around the country, most dramatically at Columbine, in Colorado, Charlie has been meeting with teachers. They have concluded that this school is small enough that no troubled kid should go unnoticed. Besides, several teachers work with students diagnosed with emotional and behavioral disorders. A counselor is available to any student seeking help. You never know for sure, Charlie thinks. But the school places a high value on prevention.

On his office wall hang photographs taken canoeing in the Arctic. Red canoes drawn up on tundra. Caribou. A wolf prowling. A trimmer Charlie, beard still dark, holding up an enormous lake trout, with social studies teacher Bill Haines there, too, removing the hook. Bill will retire this year. So will four other teachers. They are among Charlie's oldest colleagues. They are his friends.

A few minutes later, Charlie is in the auditorium, welcoming seniors. "I have to tell you about my family's recent canoe trip in Maine," he says, noting that his older daughter teaches in Manhattan. His younger daughter went to Harvard on a basketball scholarship; this canoe trip was to celebrate her engagement to a professional hockey player. "My wife signaled it was time for a toast, and I got emotional. My daughter exclaimed, 'Dad! Will you get a grip!' So that's my motto for this year—'Charlie! Get a grip!' If I talk about the kids who died or the teachers who are leaving, and I seem to be losing it, feel free to say, 'Charlie! Get a grip!'" From the assembled students, good-natured voices call out, "Charlie! Get a grip!"

Near the cafeteria, the new transfer student, a sophomore named Brian Friend, tugs at his Yankees cap, watching strangers throng by. His adviser, French teacher Ed Skea, spots him huddled against the wall. "I feel extremely nervous, like I'm going to throw up," Brian says. "Let's get some lunch," Ed tells him.

Grace thanked teachers for putting up with her. "It was the most difficult thing I'd ever done."

At a jammed cafeteria table, Ed casually introduces Brian to students. He points out that other transfer and foreign-exchange students have come from as far off as Texas, Argentina, Germany, China. Brian has cheered up by the time Charlie Phillips arrives to talk to new students in the cafeteria.

"This school is one of the tops in the state," Charlie says, citing SAT scores and other measures. "There may be a few of you who haven't had a happy or successful school career so far. Now, here, you can start brand-new, all over."

Esther Shiner heard Charlie speak. Now she is making freshman orientation rounds. Her next stop—she reads it on her schedule—is the Student Assistance Program.

It turns out to consist of Chip Keinath, a six-foot-six-inch former college defensive tackle. He is a counselor, he explains, specializing in drug and alcohol abuse. "But I'm here to provide support with whatever is going on in your life—heavy things, light things, parent issues," he says. "Maybe your dad has an alcohol problem, or your parents are never around, or we may talk about cliques, or about friends." He introduces a senior—we'll call her Grace. She has curly red hair and an infectious grin. Esther listens, raptly, as Grace tells how she sought Chip's help.

"My father isn't around," she says. "My mother's life is drugs, parties, alcoholic boyfriends." She explains that she lives in a housing project. "When I was 8, we moved to Montpelier. I was the fat new kid in school. They picked on me. I had so much anger. If anyone said anything to me, I'd punch them, whether it was a student or a teacher. I only had friends who wanted me to beat somebody up. I was a nightmare.

"When I got to high school," she continues, "I heard Chip was a big bad guy who'd brainwash you. I made up a story about having a perfect family. One day, I exploded and told him my life wasn't perfect. He didn't look surprised."

In tenth grade, Grace decided to change. "That's not easy, once you're branded a bully." Teachers offered help. "I used to scream and yell," she says. "In the fourth quarter of my sophomore year I made honors for the first time; I decided people don't tell teachers they're appreciated."

Grace unexpectedly walked into a faculty meeting. She thanked teachers for putting up with her. "It was the most difficult thing I'd ever done, and I was crying," Grace says. "I looked to Chip for support, but he was crying. And when I looked to the teachers for support, they were crying. And then I realized that I could touch other people as they'd touched me."

Grace's grades are A's and B's. She plans to become an English teacher.

Sometimes Grace and other students who work with Chip talk to classes about drug addiction, abuse, neglect, sexual molestation. Chip often speaks at other schools and universities. He tells teachers, "As we diagram sentences and talk about the Pythagorean theorem, the rest of life is going on, too."

"If I hadn't gone to see Chip, I might not even be here," Grace tells the freshmen. "Now, on to college!"

ADVANCED PLACEMENT

TIM BENTLEY, A JUNIOR, IS MEETING with guidance counselor Cary Friberg. "I've been accepted to go to Australia next semester, for that exchange program," he tells her. "My main concern is AP Biology." Advanced Placement Biology is a college-level course, taught by one of the high school's teachers.

As a freshman, Tim had asked to take chemistry, usually for juniors. But the boy was compelling. Cary helped to persuade the science department. "I'm putting my reputation on the line," Cary joked. Tim's chemistry grade was A-plus.

During the summer after his freshman year, Tim arranged to take Algebra II as a self-study course, so he could take physics as a sophomore. He set up a Community Based Learning course in C++ computer language, working via e-mail with a professional programmer. He was elected to the student council. The students also elected him twice as their school-board representative. He plays on Montpelier's soccer and tennis teams.

At one point, helped by Cary, he looked at private schools. But he decided he could do as well at Montpelier High. Now, however, to spend next semester in Australia, he must postpone his two-semester AP Biology course until next year.

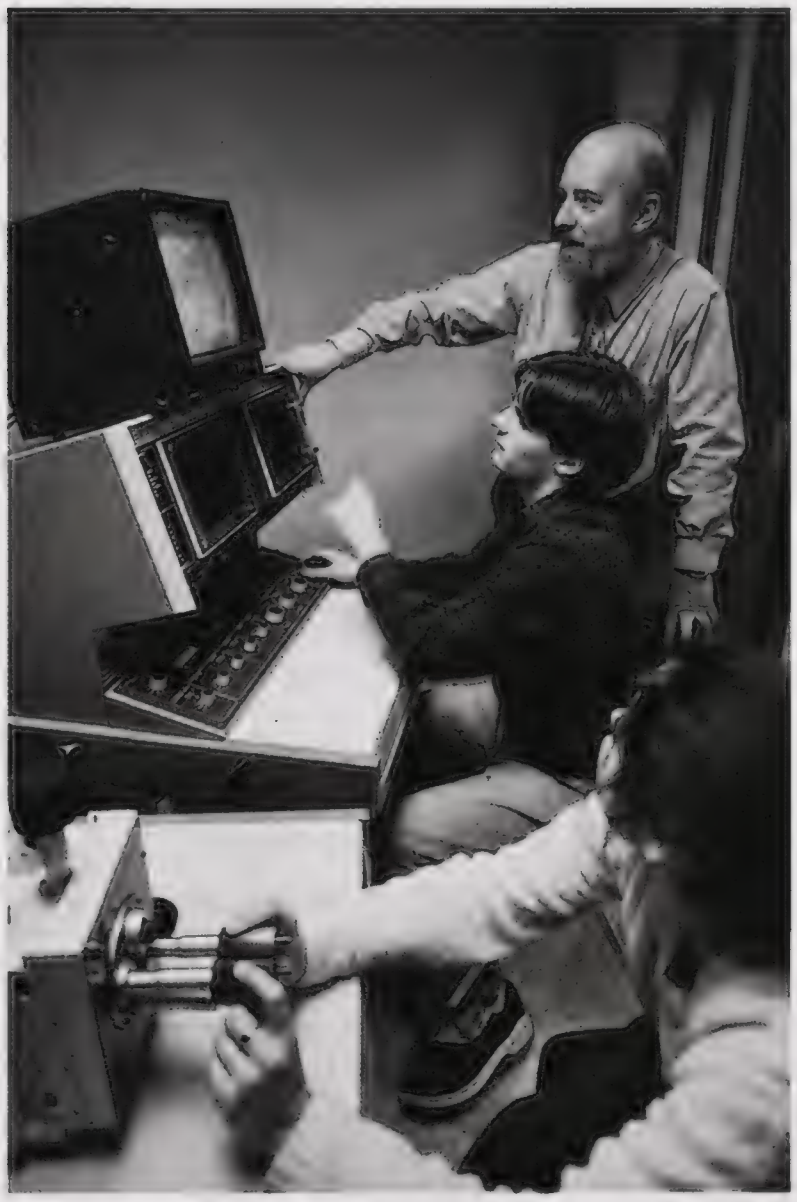
"But," Tim points out, "there's a problem taking AP Biology next year." Charlie Phillips has suggested he attend a nearby college his senior year, simultaneously completing 12th grade and his freshman college year. "Then you could take biology at the college," Cary Friberg explains. But Tim grimaces. "I'm worried it wouldn't be as good as what Ms. Smereka teaches here," he says.

In the end, Tim decides to give up AP Bio for his junior year. Instead, he will take Advanced Art. Meanwhile, under the direction of a science teacher, he will take an independent course in theoretical physics—quantum mechanics and relativity.

PASSION FOR SCIENCE

IN HER ASTRONOMY CLASS—SCHOOL has been under way several days now—Esther Shiner is building an astrolabe, an ancient instrument for observing the position of celestial

English instructor John Bate, left, and social studies instructor Bill Haines offer an American Studies class that is one of the most popular courses at the school.



Gary Jedinak, who works intensively with a group of only 20 to 30 students at Montpelier, confers with a youngster in his special education classroom.

Science teacher David McGraw assists two biology students who are using the school's scanning electron microscope to study the structure of wood.

An entire class can work on the microscope's up-close pictures of a maple-leaf cell's nucleus.

bodies. Esther runs an electric drill, boring a hole through a wooden dowel. The dowel will stick up from a wooden base. At the dowel's top, Esther will bolt a metal semicircle, the sighting device. Affixed to the semicircle are tiny pictures of great astronomers, like Galileo and Kepler. As instructed, Esther has added a snapshot of an astronomical newcomer, Esther herself.

Overseeing the astrolabe builders is teacher David McGraw. As a young boy, he followed his parasitologist father to ponds and meadows. He earned a master's in plant ecology, planning a research career. But he decided to teach. His students may climb mountains to core trees for ring samples. At various altitudes they measure winds, temperature, humidity, pressure, soil moisture. They count tree species. Back at the school's computers, they crunch their numbers and graph the results to answer questions. Why, for instance, as you climb the mountain, might it sometimes get warmer?

In an adjacent room the school's scanning electron microscope hums. David McGraw wheedled the used machine from IBM, a donation. It is hooked to the networked computers in the school's image-processing lab, so that an entire class can work simultaneously on the microscope's up-close pictures of a maple-leaf cell's nucleus or a fly's neurons.

But right now Esther's class is building astrolabes. Soon, across town, families will be aiming astrolabes at the October night sky, getting a fix on Saturn and Jupiter.

A few blocks from the high school, Brian Friend—as always, wearing his New York Yankees cap, plus camouflage pants and heavy boots—clambers down the bank of the Winooski River with other student volunteers. It is the annual riverbed de-littering. As the student-council president announced, "The town invests over $70,000 educating each of us, and the river cleanup lets us give some of that back."

After pulling a supermarket cart and blown tires from the river, Brian walks back to the high school, sopping to his knees, talking about how local artists will transform the junk into sculptures for exhibit around town. "I like this school a lot better than my old one," he says.

AMERICAN STUDIES

"THIS WHOLE BOOK IS JUST AN EXcuse to slack off!" one boy says, disgusted. Tim Bentley raises his hand. "But you have to keep in mind that when Thoreau was writing *Walden* it was considered the most divine possible way of living to do nothing at all."

English teacher John Bate interjects: "When Thoreau went to live in that cabin on Walden Pond he was conducting his own business, and he was very disciplined—he spent years, for instance, trying to figure out how seeds spread across the landscape, studying seeds in snowdrifts . . . "

"Well, this guy is like the cheapest, most frugal guy I've ever heard about, and I wish I hadn't," announces another boy. "How could he possibly for two years of his life not buy anything? Why can't he go out and buy a furnace or something?"

John Bate, wearing jeans and a denim work shirt, his longish, curly light-brown hair gone only a touch gray in the 25 years since Bob Dylan's heyday, when John was still a new teacher, takes in the roiling debate. Was Thoreau a genius or a jerk? His teaching partner, social studies instructor Bill Haines, listens intently. One reason Tim Bentley took this sought-after American Studies class is because he had been stimulated by both teachers in the past. And he wanted to see how Bill Haines, a serious man who expresses his thoughts about history and society in linear order, would work with John Bate, a mischievous elf in front of the classroom, whose thoughts issue stream-of-consciousness style, the mental romp seasoned with irony. Tim is getting a bang out of this class, which begins by looking at the years 1820 to 1860, focusing on the changing economics, while reading the period's literature, like *Walden*, to see how people then lived and thought.

"I find a lot of what he says is put in a rather immature way that might irritate some people, like adolescent rebellion," says one girl.

"How many of you get irritated listening to your elders?" John asks. A lot of hands go up, including his. Tim's hand has not gone up: "I think it's a big problem today that kids don't listen to their elders, as maybe they used to . . . " "It's not that you can't learn from older people," John says. "But can you trust them? Say, you trust me, don't you? You trust what I tell you about Thoreau, don't you? Because I'm very sincere! Actually, I can tell you sincerely that I disagree with Tim Bentley—look around at the world we've made. Do you want to listen to us?"

A girl, after pondering this exchange, raises her hand. "I read Thoreau, and then I look at myself, and the way I relate to society, and I realize I'm more materialistic than I think I am," she says. "It's not what I really want . . . "

Hands go up.

"GARY'S KIDS"

IT IS 7:45 A.M. GARY JEDINAK CONvenes a class designed to help some of "Gary's kids" get through the day. Five boys and six girls. One boy—big pants, backward baseball cap—ambles in after the buzzer. "You're late, bud,"

For an Advanced Placement English class, Kerrin McCadden, left, directs students who are doing a reading from *Hamlet*.

Gary tells him. "I can't help it," the boy says. Gary nods to an aide: "Take him to the office to sit until he is feeling ready."

"OK," Gary says, "a quiz. You're in the cafeteria. It's crowded. Someone mentions your name. They say something unflattering. How much control do you have over this situation?"

Gary is large, muscular, energetic. As the students debate, he prowls the front of the room like a jaguar. He moved from a Virginia farm because he thought Vermont milk prices would be better. It was a mistake. In 1986 he gave up working the Vermont farm. He had studied education in college. And a school official told him, "You're a big guy—why not try special education?" He liked working with emotionally disturbed kids so well he earned a master's degree. As he puts it, "I like giving a shot to someone who, in the past, wouldn't be given a shot.

"What do we mean by the power of high self-esteem?" Gary says. "Well, like you control it," one boy answers. Gary gives the class his jaguar grin. "I have a really bad cold, so I'm not feeling good," he says. "How do I use my power of high self-esteem to come to school and work eight hours?" Hands go up: "Medicine!" "Ignore it!" One girl offers: "You remember that you love us so much?" "Let's not go that far," Gary growls. "OK," he says. "I dress extra snappy so I'll feel better about myself." Skeptical eyes. "It probably doesn't look snappy to you, but for me, it is."

Any student can choose to see Chip Keinath. Gary's kids, however, fall under special education laws. They are not volunteers. "No kid says, 'I want to work intensively with Mr. Jedinak,'" Gary explains. He works with 20 to 30 students, all diagnosed as emotionally or behaviorally disabled. Some are deeply depressed. Some are low-IQ youngsters, for whom school is agony.

Gary's kids fluctuate. Many are state wards, shifted among foster families or group homes, changing school districts. Some run away. Some go to jail. Some come to school from jail, on parole. "One out of 11 kids with whom I work gets to be a solid citizen," Gary says. Once he worked with three boys, one of whom was arrested for rape. One became a cocaine addict. The third boy has had bouts with alcoholism but has stayed out of prison. He works at an insurance company. Gary regards him as a resounding success. "We're looking for millimeters with these kids, not yards," he says. "A millimeter is a football field to us."

Each of Gary's kids, at some point, blurts out: "I just want to be a normal kid, Mr. Jedinak!" "They mean,

"We work very hard and we find that we get tired a lot—kids can see that. I love this job!"

they're tired of hurting," Gary says. "To be them is to be like this—you wake up from a nightmare and your heart's pounding, but for these kids that goes on 16 hours."

"Hey, we've made it through our first five-day week of school!" he announces, as an aide brings in a cake. "Close your eyes," Gary says. "How many slices of cake do we need for everybody? Don't look. And don't forget to count the guy who got sent to the office." As the aide distributes the cake, Gary prowls, telling students, "This is my first attempt at a cake this year, made at 3 A.M. this morning—

Junior varsity players applaud senior Amber Wilder, girls' varsity basketball captain.

remember, I grew up on a farm! You probably noticed that this cake came out lopsided, but that's because our house must actually be crooked!"

Afterward, Gary checks in at the office that oversees special education students. By federal law, public schools must provide every child, no matter how disabled, with a free and appropriate education. Montpelier's schools interpret "appropriate" to mean integrating every possible child into regular classrooms. Many of these students have mild handicaps, perhaps a reading disorder. Other teachers and aides work with a girl who is severely developmentally disabled and a boy in a wheelchair who has both cerebral palsy and autism. An aide tends him all day, wheeling him out of classes if he shrieks. In their different ways, Gary's kids can also be disruptive.

Second period. Gary is making his rounds, peering into a classroom. His eyes fix on a skinhead boy. Is the boy bearing down hard on his pencil? Stressed? Gary pads into the room. "How's it going?" he whispers. "Not so good today, Mr. Jedinak," the boy whispers back. But he is defused.

"I'm gonna slug Martha," a girl announces. "OK," Gary says. "But then we'll call the police, and there will be assault charges filed." Nobody is slugged. Gary knew the bellicose girl really wanted reassurance he was still on her side.

Gary is at school by 6 A.M., sometimes roaring in on his motorcycle, so students can telephone him: "Mr. Jedinak? I couldn't sleep all night. I don't know what kind of day I'm going to have." He patrols the corridors. Is one of his boys hugging the lockers? Does he jerk when people walk by? Is he walking fast with his head down? If you stand close, does he back away? "How's it going?" Gary asks.

One girl, who never washed unless Gary and an aide drove her home, is now learning a trade. One boy who ripped pictures off walls is now a plumber. Gary glows, proud.

His father, then age 80, once drove in from Ohio and got lost in town. A ball hit his car. A gang of teenagers circled around, jeering. "Hey," the aged man said, "do you know Gary Jedinak? Yeah? Well, I'm his father!" Instantly the jeering stopped.

"We work very hard and we find that we get tired a lot—kids can see that," Gary says. "I love this job!"

ON CHARLIE'S MIND

CHARLIE PHILLIPS IS TEACHING HIS English class. These are seniors whom Charlie describes as "not motivated." Some go to college. But others are special education students. One boy, stomping in, slams down his backpack. He quiets when Charlie speaks.

"I'll be interested in your reaction to this story," Charlie says, handing out copies. "It's about a strange situation." Charlie looks over the class like a benign bear as the students begin to read. He helps a girl read through a difficult passage. A boy raises his hand. Charlie kneels beside his desk, listening intently.

Three years ago, when he became principal, Charlie kept this course. He likes kids. To him, that is teaching's essence. And he believes stories students read here help them think about their situations. Charlie's eyes light on a boy with crutches, a special education student, struggling academically.

Saab vs. Ross vs. Wenneker

A rear-end collision is followed by whiplash. Whiplash is followed by a lawsuit. But court settlements are not a remedy for pain. This is why Saab focuses on prevention. We designed the Saab Active Head Restraint, the world's first and only system of its kind. In a rear-end collision, the head restraint is designed to move upwards and forwards, catching the head before forces thrust it backwards. The risk of whiplash injury is greatly reduced. Justice is served.

www.saabusa.com
1 800 SAAB USA

© 1999 SAAB CARS USA INC

"What we try to do in this school," Charlie Phillips says, "is to err on the side of human kindness."

On the right are three friends who have had difficulty staying in school. Now they've formed a little rock band.

As principal, Charlie finds, he can make time for extra work with a student. He can arrange time off for students needing outside help. Every year, he knows, at least one kid graduates because he teaches this class and he is principal.

"How is the lead character in this story different from most people?" Charlie asks the class. "He was ignorant." "He says what's on his mind!" "He's so bold, so incorruptible!" "He doesn't have an ounce of trust." Charlie regards that comment with gentle skepticism. "Are you sure?" he says. "What are some specific examples of his not being trusting?" "He takes his daughter out of high school for wearing makeup." Charlie asks: "Is there anyone he trusts?" "Himself." "His .12-gauge and his .22!" "He trusts his store, and he says his store is almost like a person." Charlie asks: "How many have taken psychology?" Scattered hands. "Is there a word for this kind of person?" "Paranoid."

Now the students scribble on worksheets. Charlie thinks about the talk he will give next period, to the school's 12 teacher interns. He will explain the new Personal Learning Plans—they require counseling students, and some teachers resist. Also, Charlie has been working with a management team, 12 faculty members, reaching decisions by consensus. This year the team will double. Will it be too large? And some freshmen say the middle school is academically tougher. Something must be done.

Other concerns cross Charlie's thoughts. Last night was the year's first roundtable meeting, open to any citizen wanting to discuss an issue.

"I'm not inclined to think this plan for an open campus is a good idea, with kids able to leave school when they don't have classes," one man said, speaking of a student council request. "There's a feeling kids in the United States aren't getting enough education as it is." Another man named a teacher his son dislikes. "That brings up the nature of public schools and teacher contracts," the man said. "How can we get rid of the teacher's union?" A woman glares at him across the table. "That's a can of worms, with no simple solution," she says.

Someone asked about the arts. One of his goals, Charlie responded, was to see the arts match athletics' appeal. A local professional theater troupe, he pointed out, now operates the school's drama club, staging plays like *Waiting For Godot*.

His English students begin handing in worksheets. Glancing out the window, Charlie has a pleasant thought: canoes. He, John Bate and Bill Haines, veterans of Arctic canoe treks, will offer canoeing instruction during the school year. They launch the canoes from the banks of the Winooski, at a site that is just behind the school.

As Charlie walks back to his office, a visitor asks: What is the school's philosophy? Charlie ponders. Finally he says: "What we try to do is to err on the side of human kindness."

ASSESSMENT

AT A FACULTY MEETING, TEACHERS practice filling out the student assessment forms, called MAPS. They are assessing the high school itself, as if it were a student. Owen Bradley, an administrator, stands at a board, felt-tip poised. "History?" Owen asks. Teachers suggest key events in the school's evolution. "Dreams?" Owen prompts. "Dislikes? Strengths? Weaknesses? Bright Ideas?"

"OK," Owen continues. "Here's another question: Who Is Montpelier High School?"

The teachers ponder. Somebody—to a murmur of approval—says: "Charlie Phillips!"

Principal Phillips offers a genial reminder that food should be eaten in the cafeteria.

Richard and Joyce Wolkomir are frequent contributors to SMITHSONIAN. *Photographer Wayne Sorce is based in New York City.*

How can you make sure you get the future you deserve?

You've worked hard. Achieved. Given back. And now it's time to make sure you and your family enjoy the future you've been working toward.

An American Express financial advisor can give you the expertise and insight you need to make smart decisions. We offer advice on funding your child's college education, investment strategies, and retirement planning. Everything you need to take control of your future.

Call 1-800-GET-ADVICE and own your world.

www.americanexpress.com/advisors

AMERICAN EXPRESS **Financial Advisors**

©1998 American Express Financial Corporation

Do Not Take the Javelina Lightly

BY BIL GILBERT

SOME YEARS AGO, I LIVED FOR A TIME IN THE Huachuca Mountains of southern Arizona with my son and two other students. We were studying coatimundis, a communal, raccoonlike mammal. Now and then a winter storm blew in from the Sea of Cortés and passed quickly across the Huachucas, leaving a few inches of powdery snow on the ground and what connoisseurs of these matters call a Perfect Winter Day. The sun was bright; the sky cloudless and deep blue; the air desert dry.

On such a February morning, I was in Copper Glance Canyon on the west side of the range with a native of the area named Will Sparkes. We were there because it was too nice outside to work. Copper Glance is a pretty place and we thought a good one for tracking animals, which we both liked doing. We left Will's truck at the end of a jeep trail and began making our way up the canyon along an intermittent stream, through glittery groves of ponderosa pine and Emory oak. As we started out, Will, who is a big, exuberant man, whacked me hard on the back and asked: "What do you think the poor people are doing today?"

OH YES, IT'S A TOUCHY-FEELY CREATURE ALL RIGHT, BUT THE COLLARED PECCARY, OR JAVELINA, HAS VERY BIG TEETH AND IT KNOWS HOW TO USE THEM

At least two coyotes, a gray fox, a bobcat, some deer and assorted rodents had been abroad since the snow stopped falling. At about 6,000 feet, a band of javelinas (pronounced have-a-LEE-nas) had recently crossed the stream course. Their hooves are petite, half the size of the white-tailed deer's, and if not alarmed they take short, mincing steps. Intensely social animals, they stick close together while traveling.

We eventually found those javelinas in a south-facing alcove in the canyon wall where they were feeding on prickly pear. There were several adults in the band, including a sow that had recently given birth. Beside her were two rabbit-size infants from whom hung remnants of umbilical cords. Javelinas normally bear litters of two, who are precocious, and those two were kicking up snow, shoving each other for nursing advantage, squealing and purring. Cinnamon brown in color, with white collars, inquisitive and playful, baby javelinas are among the most appealing of mammalian infants.

Javelinas have keen hearing and an excellent olfactory sense, but they have very poor eyesight. When we arrived at the clearing, the adults were peering about with Mr. Magoo expressions. We hunkered down about 50 feet away from the mother and littermates. The others snorted nervously for a bit but then seemed to lose interest and moved up-canyon to forage. The sow clearly knew we were there, however, and did not like it. Facing us, she made growling sounds and gnashed her formidable teeth. Then she charged, but halfway to the boulder where we were she stopped, and went back to the babies. They seemed unconcerned and continued romping in the snow. The mother advanced toward us twice more but each time pulled up short when she got about 20 feet away from her young. Not wanting to stress

Whether yawning (left) or sunning (above), the javelina looks a lot like a pig.

A herd of javelinas (above) explores a scrubby riverbank in Texas. In Arizona (right), wildlife rehabilitator Suzanne Simpson watches two orphans get acquainted.

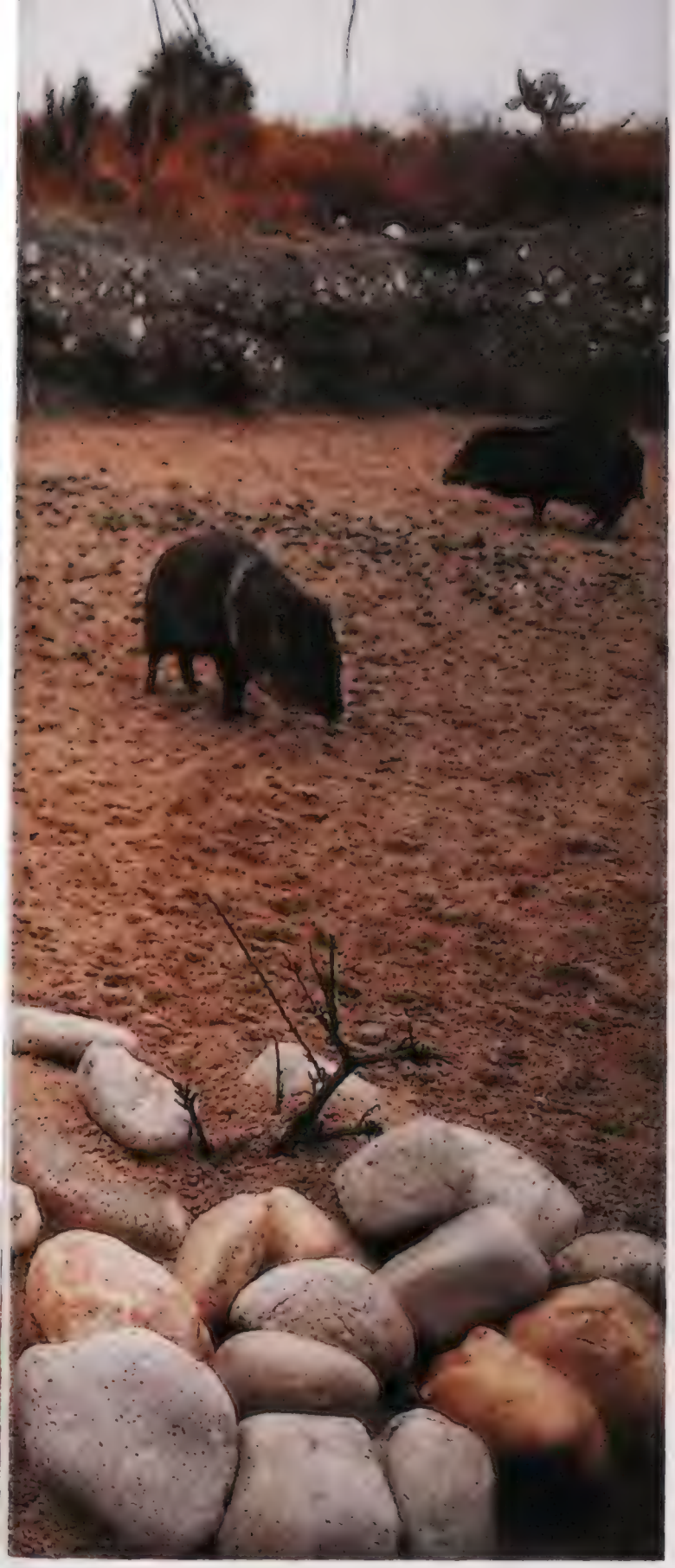
P.52 ERWIN & PEGGY BAUER; P.53 JUDD COONEY/OXFORD SCIENTIFIC FILMS

her further, we backed up and made a big swing around the herd.

Though they are often called pigs and look quite a bit like them because of their elongated snouts and nasal disks, peccaries, of the family Tayassuidae, are only distantly related to the Suidae. Both appeared 35 million to 40 million years ago, pigs in the Old World and peccaries in North America. Ever since, they have remained geographically isolated in the wild and evolved separately (though along parallel lines) as rooting, even-toed ungulates. Their teeth and stomachs are significantly different. Generally peccaries are less bulky and have proportionately longer, slimmer legs.

Fossil remains indicate there have been at least 30 species of now-extinct peccaries. In times past, some ranged throughout the United States and northward into the Yukon. When the Central American land bridge formed about seven million years ago, peccaries soon crossed it and established themselves in tropical South America.

There are three living species. The Chacoan, the largest, now is endangered; fewer than 10,000 individuals survive in northern Argentina, western Paraguay and eastern Bolivia. The white-lipped peccary is distributed throughout the neotropics from Brazil to southern Mexico. The main subject of this story, javelinas—also known as collared peccaries, or *Tayassu tajacu*—apparently also evolved in jungle habitats and then worked their way north. They are the smallest of the three species, with individuals weighing 40 to 60 pounds and standing 18 to 20 inches high. They are also the most abundant and widely distributed, having an immense range that



extends from Argentina to Arizona, New Mexico and Texas. It is estimated that there are now several hundred thousand of them in this country, with some of the most dense populations (up to 11 animals every 250 acres) concentrated in southern Arizona, into which javelinas have only recently extended their range.

Like bears, wolves and other generalists that occupy diverse habitats, javelinas have prospered more because of behavioral than physical adaptations. For example, they are poorly insulated with hair and fat, and also are not particularly efficient at cooling themselves by panting and sweating. Therefore they cannot long tolerate freezing temperatures or, in the open sun, those much above 80 degrees Fahrenheit. This is of little consequence in their native tropical jungles, where javelinas are still abundant. But it's another matter in the deserts and mountains of Arizona, where thermal conditions are much more extreme and variable, and at times potentially fatal.

The animals are able to cope by seeking and exploiting microclimates, as had the herd Will Sparkes and I met in Copper Glance. To stay warm enough, those creatures had spent the previous night packed together, sharing body heat, in a dry tunnel that faced west and caught the afternoon sun. Elsewhere, for the same purpose, javelinas use caves, hollow logs, dense thickets and the burrows of other animals. After the snowstorm passed, the Copper Glance herd had crossed the canyon to the protected cove where they—and the rocks behind them—soaked up the heat of the sun during the morning hours.

Researchers have found that in the summer, desert javelinas habitually retire during the day to shaded areas or underground retreats; they travel and feed mainly at dawn and dusk or, in some instances, become largely nocturnal. When temperatures moderate, they resume roaming about in the daylight and sleeping at night. In the Sonoran Desert and their highland habitat, annual precipitation ranges from 11 to 20 inches, with half of it falling in the three-month "monsoon" season, which usually begins in July. Then and for a few months thereafter, javelinas drink from open pools, wallow in mud, forage on fruits and nuts, dig for roots and tubers. After the last of the occasional winter storms, there is a four-month dry season with only traces of precipitation. Javelinas are then forced to travel farther, looking for moisture and greenery, and the animals become increasingly dependent on a single source for both food and water—the ubiquitous prickly pear.

This plant is among the most common cacti in the Southwest. The inner flesh is mucilaginous and edible but protected by many murderous spines. Lyle Sowls, a professor (now emeritus) of wildlife at the University of Arizona, has seen javelinas use their teeth and hooves to carefully remove the outer skin and its spines from one side of a pad. (No matter what the food, they are dainty, not at all hoggish, feeders.) The mushy prickly pear meat is low in protein and critical vitamins, but by eating up to eight or nine pounds a day, javelinas get enough food and water (about 80 percent of the plant's substance) to survive for some time. But not indefinitely, because prickly pear has a high content of oxalic acid, which has a cumulative toxic effect. Working with captive animals, Sowls found that they remained healthy for 10 weeks eating only cactus pulp. But after 15 weeks (normally about the

JEFF FOOTT; THOMAS A. WIEWANDT

When squabbling (above), javelinas flatten their ears, chatter and sometimes bite each other. A frightened animal (below) "bristles" to make itself look larger than it is.

length of the dry season), they weakened, became emaciated and, in two cases, died from oxalic acid poisoning.

Sowls came to Arizona nearly 50 years ago from the University of Wisconsin, after doing graduate work there under Aldo Leopold. He became a javelina man because, he says, nobody was then paying much academic attention to the species. Now he is regarded as one of the world's leading authorities on peccaries generally and javelinas specifically. I met him at the beginning of my coatimundi project, when I had many questions concerning the ecology and fauna of southern Arizona, about which few knew so much. Thus I became an avid admirer of the javelina and greatly indebted to Sowls.

I have heard persistent reports that javelinas are sometimes carnivorous, preying on small mammals, birds and reptiles. Several times they have been described to me as frequent hunters and eaters of rattlesnakes. Hard evidence supporting such claims is lacking. Researchers who have examined

the stomachs and scats of hundreds of javelinas invariably find no animal matter or only traces, generally in the form of insect remains. Sowls thinks a few invertebrates may be accidentally ingested as javelinas root for vegetable foods, but he doubts that they are intentional predators.

Indisputably, javelinas themselves are sometimes prey for jaguars, bears and mountain lions. Ocelots, bobcats and coyotes may occasionally nab young or weakened ones. But robust adult javelinas cannot be taken lightly or easily. In addition to being strong and agile, they have the largest and sharpest canine teeth of any noncarnivore. These operate scissor-fashion, and it is speculated that they evolved to enable the animals to cut open the hard cases of tropical seeds and nuts. Sowls is inclined to believe that the javalina's canines are used primarily for defensive purposes. There are reports of javelinas facing down and running off mountain lions and bobcats. Twice I have watched coyotes following a herd, presumably looking for easy pickings. As soon as the javelinas showed any hostility, the coyotes loped off. Foolish domestic dogs will sometimes jump a herd and then are often maimed, in some cases killed. In south Texas, feral hogs and javelinas are found occupying some of the same areas. When they meet, it is almost always the much larger hogs that retreat.

There may be more than 50 javelinas in a single herd, though 6 to 10 is typical, and in instances their numbers may intimidate predators. But accounts of herds collectively charging and piling on intruders are almost

© GUY BAUER, BRUCE COLEMAN, INC

certainly apocryphal. Occasionally they do hold their ground, as the mother with the two infants did in Copper Glance Canyon. More often, javelinas flee into the brush when disturbed. This scattering behavior may make it difficult for predators to focus on a single animal and, from the standpoint of the group, could be a better tactic than fighting.

I have heard stories about people being chased by "maddened" mobs of javelinas. The persistence of such tales no doubt owes more to the poor vision of the animals than to their innate ferocity. Once in a while, instead of scattering or standing, javelinas will advance toward something that smells or sounds suspicious, probably to get a better look at it. If "it" retreats, their curiosity may induce them to continue advancing. If a javelina is wounded by a predator or chased, the entire band may counterattack. It is known that individual peccaries will sometimes confront a predator while its companions flee. My experience and that of others is that if one shouts or throws a few pebbles, javelinas, unless cornered, most likely will stop their "charging" and run off. Anyone who tries to corner a javelina deserves to get bitten, and very well might.

The gaudiest attack story I've heard was told by a deer hunter I encountered one afternoon in Cave Canyon at the south end of the Huachucas. "Javelinas will chase a man up a tree, wait around the foot of it until he starves to death and falls out," he said. "Then they'll eat him, bones and all."

Occasionally, aged or injured animals become solitary. Otherwise javelinas stay close together, frequently rubbing against one another, vocalizing back and forth with barks, grunts, woofs and purrs. Most noticeably, they often anoint their companions, rocks, logs and brush with a pungent musk, released from a nipple-size gland near the base of the tail. In places where javelinas regularly bed, feed or travel, the odor they leave can be overpowering. Since the animals have poor vision and often operate in dense thickets, their scent is probably important as a means of keeping informed about the activities and whereabouts of herd mates. It is also possible that the stench is actually pleasing to javelinas.

Quenching its thirst, a javelina nibbles on the mushy pulp of a prickly-pear cactus.

Though they are highly social creatures, javelinas are not rigidly organized on the order of clans of horses, wolves or lions. In terms of age and sex, the composition of their herds varies from group to group and appears to be serendipitous. Neither adult males nor females seem to serve as permanent leaders. There is some squabbling, but domination and status appear to be of relatively small concern. Depending on their numbers and available resources, the foraging territories of herds range from just over a hundred acres to more than 1,000. But they are not vigorously defended against neighboring javelinas, and it is not uncommon for individuals to leave one herd and join another. Seemingly, their principal desire or need is to be with some others of their kind, not necessarily particular other ones. In addition to providing for social satisfaction and mutual defense, this compulsion has practical benefits in areas where resources are often unevenly distributed. En masse, javelinas are better able to seek out places where they can all profitably feed together.

During their first few days, infant javelinas readily accept other creatures as surrogate mothers or herd mates. Consequently, companionate relationships between people and young ones are not uncommon. As a teenager, Will Sparkes found and raised an orphan who became jealously attached. "He never bit anybody," Will says, "but if somebody got too close to me, he'd clack his teeth and the hair on his back would stand up. And if a stranger came up to the place, he'd start barking."

Will had an old truck he used to drive back and forth to high school in Bisbee, Arizona. "The javelina somehow knew when I was due back. He would meet me at the cattle guard down the road and squeal. I'd stop and let him ride the rest of the way with me. There was a herd in the canyon, and after a year he started visiting them. One day he just never came back. I guess he was all right and that this was best for him in the long run. But I sure did miss him."

Others have had similar experiences. There are ranchers who kept hand-raised javelinas around their places because, they've told me, they made better guards and were generally more interesting than dogs. Such arrangements aside, peccaries have never been domesticated, as have pigs. Yet for many centuries, they have been an important dietary item for people living in Central and South

G. C. KELLY

A couple of youngsters, probably less than a month old, follow closely behind their mother. When hand-raised by humans, javelinas sometimes become jealously attached.

America, whose relationship with the animals was apparently a stable, predatory one that did not much affect their numbers or distribution.

In the past 50 years, however, millions of peccaries have been taken by commercial hunters in that part of the world. The meat has been sold in local markets and the hides have been exported to Europe and the United States where, for some purposes, they are considered more desirable than pigskin. This pressure, along with habitat despoliation, has significantly reduced and in some places eliminated peccary populations.

In the United States, the meat-and-hide trade was halted in the late 1930s, and javelinas are now managed as a game species. Presently some 20,000 to 25,000 of them are taken annually by sport hunters in Arizona, New Mexico and Texas. (Although I've often been assured that properly cooked javelina meat makes better eating than pork, it has been my misfortune never to know a really good javelina cook.)

Sport hunting in this country has not adversely affected the species, but in some localities, relations between javelina and people have begun to deteriorate. Southern Arizona provides perhaps the best illustration of problems in this regard. For the past 30 years, many people have left Tucson, Nogales, Sierra Vista (at the northern end of the Huachucas) and smaller communities and resettled in the surrounding deserts and hills. Along with some of his students, Paul Krausman, a professor of wildlife management at the University of Arizona, has been studying the effects of this influx on javelinas. In the initial, exurban stages when developments are scattered, new landscaping, gardens and water sources enrich areas for javelinas. The animals exploit them enthusiastically, often to the delight of some new homeowners, who find mingling with wildlife a reward for moving out of the city.

But as more and more houses, infrastructure and commercial facilities continue to be built, the javelinas' natural foraging and bedding areas, and the trails they regularly use, are reduced or eliminated. The animals and humans encounter each other more frequently. Javelinas rooting about in gardens, defending themselves by mauling dogs and occasionally biting people cease to be civic attractions and become "problems."

Krausman says there is only so much that can be done about this. In intensively developed areas, javelinas may simply have to be removed. In areas containing, at most, one house for every ten acres of land, javelinas and people can coexist only if planners preserve "habitat islands" where the animals are free to function in their traditional ways. Also, residents must be persuaded that attracting javelinas with feeding and watering stations is contrary, in the long run, to the best interests of both species.

Suzanne Simpson has a degree in wildlife management and is a middle-school science teacher and a licensed wildlife rehabilitator. She and her husband, Ken, live in Green Valley, a well-established bedroom community located between Tucson and Nogales in prime javelina country. She has

G. C. KELLY

SILHOUETTE Premiere

SOME TRIPS ARE JUST MORE MAGICAL

START enjoying the trip. Silhouette Premiere, the first minivan with a built-in audio/video entertainment system,* plays movies, video games and music. Add headphones for four, dual sliding doors and a 5-star side impact rating,** and everyone gets their wish.

Test drive any new Oldsmobile Silhouette

GET A $25 BLOCKBUSTER GIFTCARD® FREE

Good for movies, video games, treats and more. Perfect for your Premiere.
Call toll-free 1-877-VAN-MAGIC for your test drive certificate.

Oldsmobile
START SOMETHING™

BLOCKBUSTER Entertainment Headquarters Of The Silhouette Premiere

www.silhouettevan.com

©1999 GM Corp. All Rights Reserved.

*Factory installed. May not be available in some states. Monitor visible only from 2nd & 3rd row seats. **Based on National Highway Traffic Safety Administration NCAP tests. Test-driver must be 21 years of age with a valid drivers license. THE WIZARD OF OZ and all related characters and elements are trademarks of Turner Entertainment Co. ©1999. Judy Garland as Dorothy from THE WIZARD OF OZ. BLOCKBUSTER name, design and related marks are trademarks of Blockbuster Inc. ©1999 Blockbuster Inc. All rights reserved. Membership rules apply for rental of all items at BLOCKBUSTER. GiftCards cannot be used to purchase GiftCards. GiftCards may be redeemed at participating BLOCKBUSTER stores. Limit one BLOCKBUSTER GIFTCARD per household while supplies last. Offer ends 12/31/99. See your local dealer for details.

Lying cheek by jowl in their excavated desert "bed," a pair of javelinas endures desert winters by huddling to conserve warmth. Young javelinas as well as adults will pile on.

become concerned with the growing numbers of these animals who are found injured or orphaned. Often they are picked up by well-meaning people, kept until they become difficult yard pets and then turned over to state game agents or rehabilitators such as Simpson. Some can later be placed with zoos, but otherwise they must be either put down or released in isolated areas. There, lacking herd mates to show them where to forage and to provide the togetherness so important to the species, few if any foundlings survive.

Simpson reasoned that if—using animals brought to her individually—she could create and release *herds* of javelinas, they might learn better and be more secure. With encouragement from Arizona game biologists, Lyle Sowls and others, the Simpsons constructed an ingenious herd-making facility. It consists of a series of interconnected pens in which animals are at first held separately but are able to hear, smell and see neighboring ones through fencing. If the introductions go well, the barriers are removed and the javelinas are allowed to mingle and bond. By the spring of 1994, mixing and matching in this way, Simpson had created a herd of seven apparently compatible animals. Six were females who had come to her the previous summer as nursing infants. The seventh, an adult male, had been brought in injured and was rehabilitated during the winter.

That June, state game agents picked up the herd, radio-collared two animals, ear-tagged the rest and released them on public lands well to the east of Green Valley. The results of that first experiment were disastrous, basically because it coincided with a severe heat wave. The two collared animals succumbed to extreme heat and lack of water. Not all the carcasses were found, but the other animals probably died, too.

Tragic as that was, all parties involved felt the Simpsons' approach offered the best chance of relocating at least some foundlings into the wild. And so it has been continued. As of early 1999, more than 60 javelinas in seven artificially created herds have been released—in cooler seasons and with better results. There have been fatalities, and herds have disintegrated, but at least one of them has stayed together for 11 months.

Forming herds of rehabilitated javelinas is, as Suzanne Simpson readily admits, not a long-term solution. While more habitat preserves will improve the situation, Simpson thinks that food-and-water-rich suburbs will always attract some opportunistic wild animals. It is her view that people are the ones who have to adapt. As the area's most prominent javelina activist, Simpson frequently receives complaint calls and has developed a stock response. "I tell them javelinas were here first. People should fence in their rose bushes and dogs and enjoy the javelinas. They are smart, instructive and entertaining. Having them around is a bonus, not a penalty, for living here."

Bil Gilbert is the author of 28 articles for SMITHSONIAN. *The first, about coatimundis, appeared in 1982. He profiled the naturalist Constantine Rafinesque in January.*

KENNETH FINK/BRUCE COLEMAN, INC.

You'll find the lowest term life rates in America at Quotesmith.com or we'll overnight you $500. Other pleasant surprises now include instant auto, life and medical insurance quotes from 375 large, safe & well-known companies.

$250,000 Term Life Sampler
Guaranteed Annual Premiums/Guaranteed Level Term Period

Female Premiums

Age	10 YEAR	15 YEAR	20 YEAR	25 YEAR	30 YEAR
35	$ 118	$ 135	$ 155	$ 208	$ 213
40	$ 148	$ 183	$ 185	$ 263	$ 273
45	$ 200	$ 210	$ 265	$ 360	$ 393
50	$ 260	$ 305	$ 375	$ 535	$ 590
55	$ 380	$ 428	$ 578	$ 1,018	$ 1,065
60	$ 528	$ 675	$ 865	$ 3,140	$ 3,140
65	$ 838	$ 993	$1,633	$ 4,100	$ 4,100
70	$1,400	$ 1,637	$3,283	$ 5,270	$ 7,220
75	$2,797	$ 4,770	$6,560	$10,370	$10,370

Male Premiums

Age	10 YEAR	15 YEAR	20 YEAR	25 YEAR	30 YEAR
35	$ 138	$ 153	$ 178	$ 245	$ 273
40	$ 161	$ 199	$ 243	$ 345	$ 360
45	$ 240	$ 315	$ 375	$ 500	$ 523
50	$ 358	$ 483	$ 558	$ 798	$ 838
55	$ 535	$ 720	$ 848	$ 1,640	$ 2,810
60	$ 860	$ 1,070	$1,353	$ 4,100	$ 4,100
65	$1,453	$ 1,813	$2,850	$ 5,270	$ 5,270
70	$2,620	$ 3,503	$5,405	$ 7,370	$10,070
75	$4,415	$ 7,848	$9,650	$13,640	$13,640

"Quotesmith provides a list of all insurance companies & plans that match specific needs. The first to make available this new custom -search service." *- Nation's Business*

"Quotesmith saved us time and money. I shopped from my own office and found the best deal available. I was impressed."
- Linda Picazio, Ft. Lauderdale, Florida

"Get quotes on the spot. New source for best buys in insurance. One way to get to know the market." *- Kiplinger's Personal Finance*

"Quotesmith ranked more than 250 policies for Forbes. The premiums vary wildly." *- Forbes*

"Quotesmith keeps a database of about 350 insurance companies." *- Good Housekeeping*

"Quotesmith offers particularly thorough searches."
- Los Angeles Times

"Researching insurance companies can be confusing and tedious. To simplify the task, call Quotesmith."
- SmartMoney

"Quotesmith will scan the insurers and provide a list of different policies suited to your needs." *- Money*

"Enter the virtual agent. This solution has value for those who value immediacy and privacy."
- U.S. News & World Report

Quotesmith.com is the only Internet site on earth where you can get instant auto, life & medical insurance quotes from 375 top-rated companies. It's lightning fast, easy, informative, unbiased, private and *FREE!*

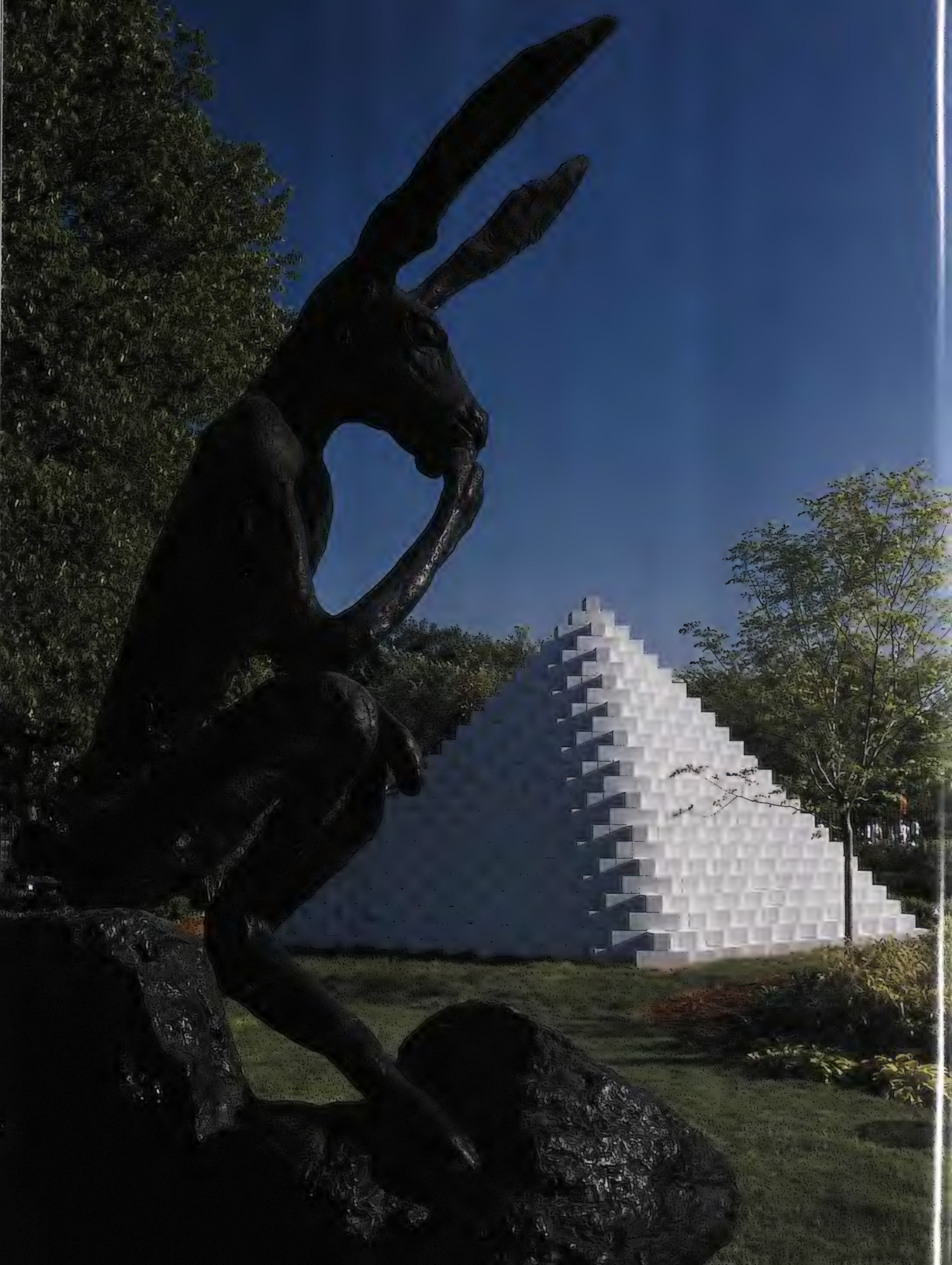
We give you detailed information - including underwriting requirements - and the latest claims ratings from A.M. Best, Duff & Phelps, Moody's, Standard & Poor's and Weiss Ratings, Inc. on every term life quote. And when you're ready, you can request an application from the company of your choice online, without having to talk to any insurance salesmen! Avoid buying mistakes and bad advice. Use the Quotesmith high speed insurance price comparison service before you buy or renew any insurance policy.

Quotesmith.com®
incorporated

Quotesmith.com

AD CODE: SMITH 8/99

Final premiums and coverage availability will vary depending upon age, sex, state availability, hazardous activities, personal and family health history. The non-tobacco use premiums shown above may include: Banner Life Ins. Co., Rockville, MD, form RT-97; Federal Kemper Life, Long Grove, IL, form S-4007; First Penn-Pacific Life, Hoffman Estates, IL, form BT-1002AA(2-96), Control #B98-198(3/98); General Life, Edwardsville, IL , form 70006; Old Line Life, Milwaukee, WI, form 80-RCT 79D; Old Republic Life Ins. Co., Chicago, IL, form 8-1077; PHL Variable Life Ins. Co., Hartford, CT, form T604; Security-Connecticut Life, Avon, CT, form 11420; Valley Forge/CNA, Chicago, IL, form V117-333-A Series; Premium rates shown are not applicable to residents of FL, NJ & NY. Policy forms vary by state. $500 lowest price guarantee not available in SD. CA #0827712. Some premiums shown are graded premium life policies and/or term-like universal life policies. Premium rates always escalate after initial rate guarantee period.



sculpture blossoms in a new garden on the Mall

BY STANLEY MEISLER

THE NATIONAL GALLERY OF ART HAS GIVEN THE PEOPLE A PARK FOR ALL SEASONS AND ALL AGES

PHOTOGRAPHS BY DENNIS BRACK

CROWDS OF SIGHTSEERS ARE COMING upon a magical garden on the National Mall these days, a garden that reflects the power and beauty and tragedy and laughter and illusion of art. Their find is the long-awaited National Gallery of Art Sculpture Garden, an oasis among some of the best-known museums and monuments in America. As visitors rest in its coolness, they can behold an array of spectacular sights, from a giant spider to an enormous typewriter eraser to a dynamic mass of circles, beams and triangles that pierce the sky.

Since May 23, when the gates of its six entrances opened to the public for the first time, the 6.1-acre garden has hosted parents and toddlers, touring groups of teens, well-dressed foreigners, government workers on lunch break and a host of admirers of modern sculpture. The dizzying variety of the sculptures reflects the dizzying number of movements in the modern era of sculpture. Marla Prather, the gallery's curator of 20th-century art and a key member of the team that selected the garden's pieces, describes them as "some of the greatest sculptures of the century." All 17 sculptures (an 18th, by American artist Frank Stella, is due in the fall) are post-World War II, and most are American.

The garden was conceived in the 1960s, but plans languished under red tape and red ink. The National Gallery, in any case, would not have had enough pieces to fill more than a sliver of a modern sculpture garden in the 1960s. When the museum's original, neoclassic home (now known as the West Building) opened in 1941, the gallery's rules prohibited the ownership of any work by an artist who had not been dead for at least 20 years. Happily, the trustees realized that this was a foolish rule (under it, the museum would not have owned a Picasso until 1993, a Miró until 2003) and ended the ban in 1963.

During the 1970s, the gallery focused its attention on building the modern I. M. Pei-designed East Building, which opened in 1978. For almost three decades, little was done for the site of the future garden save construction of a summer reflecting pool, which functioned as a popular ice-skating rink in the winter, and a service and food pavilion in Art Nouveau style. Development intensified in the 1990s, however, when the National Park Service transferred jurisdiction over the land to the National Gallery and, even more important, the Morris and Gwendolyn Cafritz Foundation donated $10 million to cover most of the cost of constructing the new garden. The foundation also paid for the

Barry Flanagan's amusing take on Rodin's *The Thinker* offers a whimsical counterpoint to Sol LeWitt's *Four-Sided Pyramid*.

purchase of eight outdoor sculptures.

Six years ago, National Gallery director Earl A. Powell III called in Philadelphia landscape architect Laurie D. Olin, of the Olin Partnership, to lay out the garden. Olin, who worked on the landscape design for the Getty Center in Los Angeles, decided to break from the long, rectangular pattern of the Mall. Instead of adhering to geometric order, Olin scattered almost 100 varieties of trees, shrubs, vines and plants alongside curving paths. He left spaces for each sculpture but not in a way that made the garden seem like a museum. "We didn't want the garden to be rigid and architectural," Olin says. "We didn't want the pieces to be locked in."

"We didn't want the garden to be rigid and architectural," says Laurie Olin. "We didn't want the pieces to be locked in."

Selecting the sculptures and deciding where to place them in the garden has proven, according to Prather, "about as much fun as curatorial life can get." A blueprint of the park was laid out on a long table in the offices of Mark Leithauser, the gallery's chief of design, with matchbox-size maquettes of the sculptures. "We moved them around like figures on a chessboard," says Powell. Claes Oldenburg, the Swedish-born American who created *Typewriter Eraser, Scale X* with his wife, Coosje van Bruggen, was so taken with the model of his sculpture that he played with it until it snapped in two. To get a better idea of how the piece would look in the garden, the sculptors and gallery staff marched around the park on a windy day with a swaying, full-sized cardboard cutout

The sleek, tapering legs and tensile, up-thrust "neck" of Alexander Calder's 1974 stabile *Cheval Rouge (Red Horse)* evoke the power of a thoroughbred. Calder wanted "to make things that are fun to look at."

The graceful arcs of the new fountain's dramatic, variable display echo the rhythm of the surrounding curved benches and clipped linden trees, and harmonize with the dome of the National Gallery's West Building in the distance. During the winter, the fountain will become a skating rink.

Arranged in a circle to suggest a ceremonial gathering, the elegant polished red granite "chairs" of Scott Burton's *Six-Part Seating* (1985/1998) are intended to be both sculptural and functional. Just beyond stands Mark di Suvero's dynamic, eight-ton, rusted-steel tour de force, *Aurora* (1992-93).

of the nearly 20-foot-tall sculpture.

Installing *Typewriter Eraser* illustrated the complexity of the process. The gigantic piece arrived on Constitution Avenue one morning aboard a flatbed truck. A crane then carefully lifted the five-ton stainless steel and fiberglass structure, secured in an elaborate, specially designed protective armature, and lowered it into the park. There, workers painstakingly removed the supports and cables, and unwrapped the plastic from each deep-blue bristle of the eraser's brush. A second crane then slowly raised the piece again so that it could be lowered to a base for bolting. Now one of the garden's main attractions, *Typewriter Eraser* evokes a good deal of nostalgia. "When I was in high school, before computers," a mother told her daughter as they gaped at the sculpture, "I used to use one of those."

Prather says the National Gallery wanted the sculptures to be "accessible and friendly," a goal clearly fulfilled. In fact, it seems that parents can't resist taking pictures of their children mugging on or against some pieces, especially Roy Lichtenstein's *House I*, Barry Flanagan's *Thinker on a Rock* and Louise Bourgeois's *Spider*.

American pop-art master Lichtenstein, who died in 1997, created a red, blue, yellow and white aluminum house that seems to come right out of Psychology 101 perception exercises. From afar, the cartoonlike piece looks like the outside of a house, but up close, one sees that although the side of the house appears to recede into space, it actually projects out toward the viewer. Flanagan, a British sculptor, is parodying one of the icons of late 19th-century art with his bronze hare in the pose of Auguste Rodin's *The Thinker*. Bourgeois, a French-born American, created a comforting rather than threatening bronze giant of a spider. "The spider is an emotional metaphor," she says. "It represents a mother. My mother was my best friend. She was a weaver like a spider."

The National Gallery wanted the sculptures to be "accessible and friendly"—a goal clearly fulfilled. Parents can't resist taking pictures of their children mugging on or against some of the pieces.

Not all the pieces, however, are lighthearted. In *Puellae (Girls)*, the Polish sculptor Magdalena Abakanowicz created 30 headless girls out of her memory of World War II. A child herself during the war, she was told then how the Nazis had left hundreds of Polish children to freeze overnight in cattle trucks. Each bronze child is different and the effect is haunting.

To make sure that the garden struck visitors as an integral part of the National Gallery of Art campus, the designers decided to make the terrace walls, fountain perimeter, curved stone benches and gate supports out of Tennessee pink marble—the same material used for both the West and East buildings. But that kind of marble is hard to find these days, and Tennessee Valley Marble, Inc., was only able to supply the necessary 510 tons by reopening two old quarries.

As soon as workers got the new fountain going, a few months before the garden's official opening, a mallard checked in to the rebuilt pool and deposited six eggs under a nearby bush. Dubbed Louise, in honor of the sculptor of the motherly *Spider*, the mallard and her ducklings left soon after the eggs hatched. But another duck alighted on the pool on opening day and decided to make it his home.

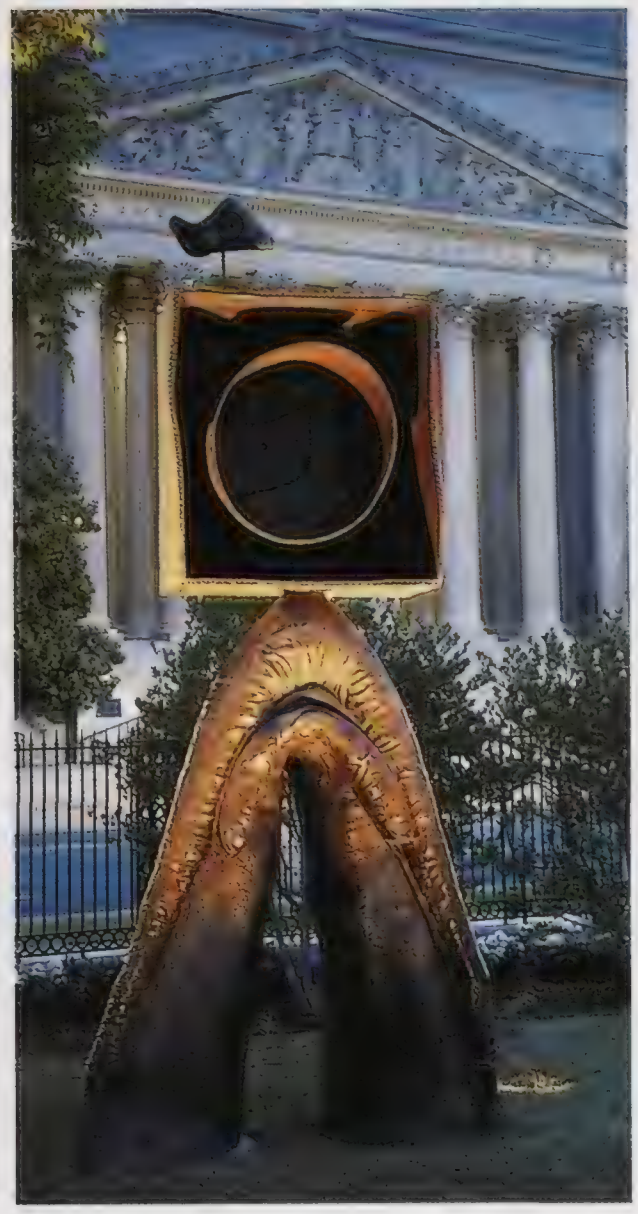
The garden's most powerful sculpture is probably *Aurora* by Mark di Suvero, an American born in Shanghai. The impressive piece creates tremendous force out of massive steel circles, beams and triangles. The title, Spanish for "dawn," comes from a dark poem about New York City by Federico García Lorca. "The dawn arrives and no one receives it," he wrote, "because neither tomorrow nor hope is possible."

Another sculpture of New York, Tony Smith's *Moondog*, named for a hulking blind folk musician who used to wander the streets of the city, is a prime attraction. A work of stunning geometric purity, the black aluminum sculpture seems almost animated, as if it were a hovering mammoth.

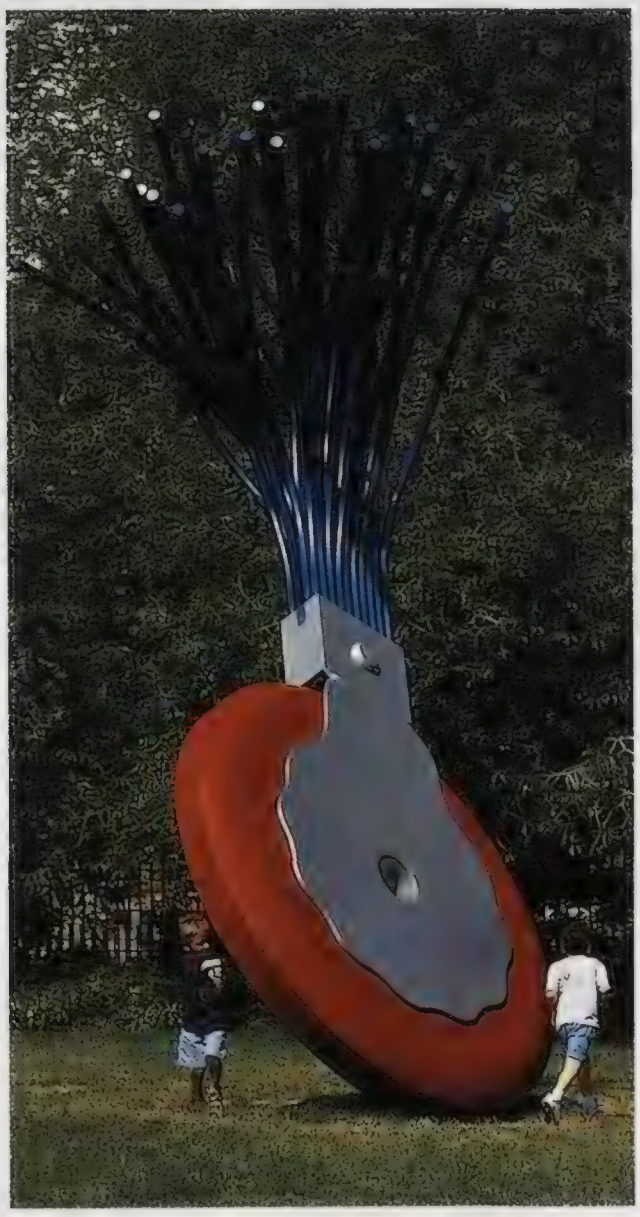
The opening of the National Gallery of Art Sculpture Garden may also serve to call attention to another imposing depository of modern outdoor sculpture—the Smithsonian's Hirshhorn Sculpture Garden, just across the Mall. The Hirshhorn site, which is more like an open-air museum, displays 50 sculptures. Some artists—Joan Miró, David Smith, Alexander Calder—are represented in both gardens, but the Hirshhorn also has works by older masters like Auguste Rodin and Henry Moore. Together the two gardens transform the Mall into a kind of paradise of monumental 20th-century sculpture.

Stanley Meisler wrote most recently for this magazine on artist John Singer Sargent. Photographer Dennis Brack has been focusing his lens on Washington, D.C. for 25 years.

DENNIS BRACK/BLACK STAR



The anonymous, rigidly posed, headless figures in Polish sculptor Magdalena Abakanowicz's compelling 1992 *Puellae (Girls)*, created from a memory about children left to freeze to death during World War II, embody the artist's response to totalitarianism. Surrealist Joan Miró's bronze *Personnage Gothique, Oiseau-Eclair* (right) juxtaposes disparate forms—donkey yoke, box and bird.



Artist Claes Oldenburg is well known for fashioning monumental sculptures based on mundane, everyday objects. *Typewriter Eraser, Scale X* (left), by Oldenburg and his wife, Coosje van Bruggen, was inspired by an image from his youth. Children make Roy Lichtenstein's playful *House I* (above) their own. The sculpture has fun with three-dimensional illusionistic effects.

INTRODUCING THE JAGUAR S-TYPE

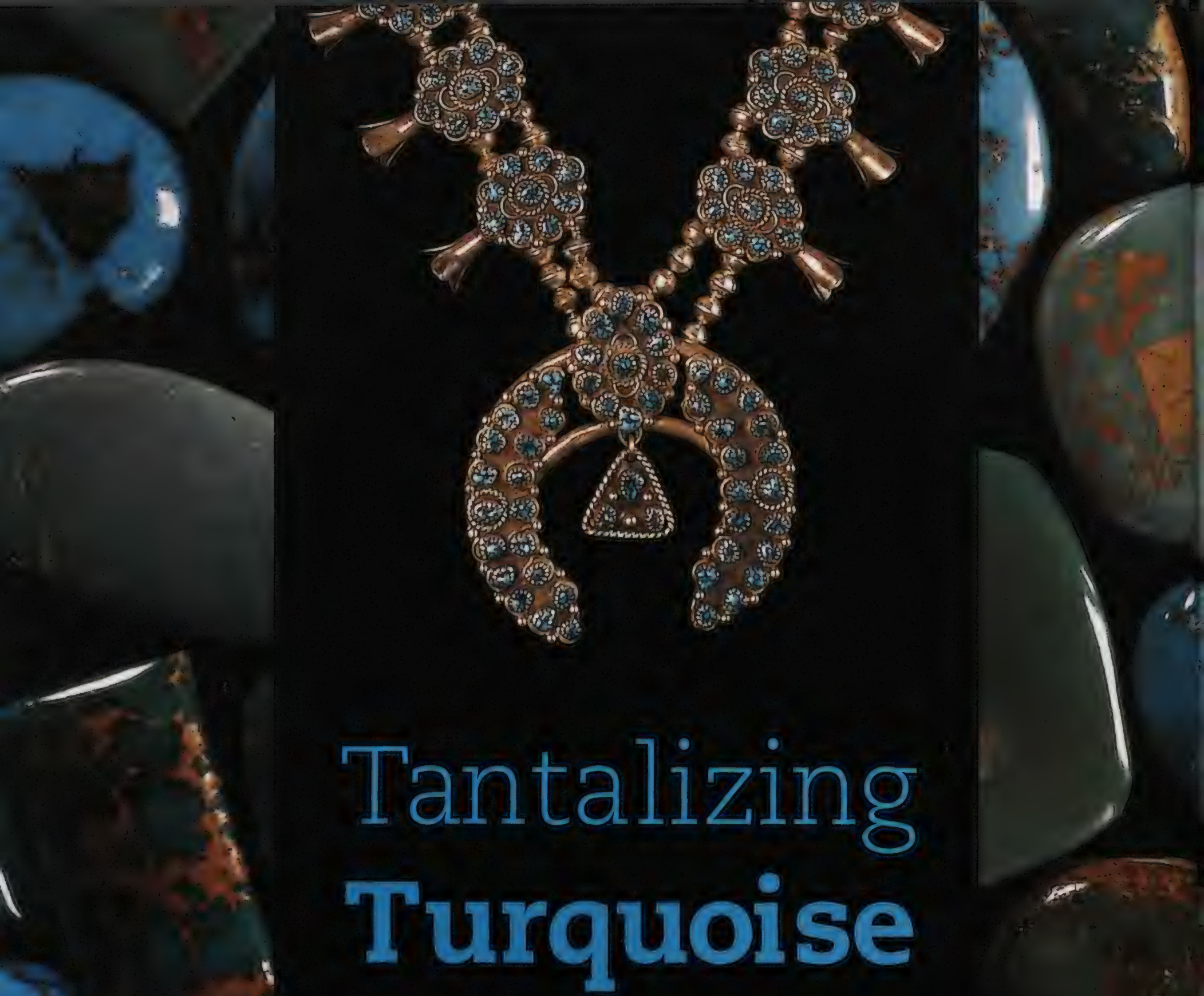
Bird's-eye maple trim interior Connolly leather Dual-zone climate control system Voice-activated controls

THE BLENDING *of* ART *and* MACHINE

60/40 split rear seat Integrated Navigation System 4-year/50,000-mile warranty.*

JAGUAR

*See your retailer for details of this limited warranty. For more information, call 1-800-4-JAGUAR or visit us at www.jaguarusa.com. ©2001 Jaguar Cars



Tantalizing Turquoise

BY JOSEPH A. HARRISS

THE BRILLIANT BLUE-GREEN GEMSTONE, PRIZED BY ADMIRERS FROM ANCIENT TIMES TO OUR OWN, COMMANDS A BOOMING, BILLION-DOLLAR MARKET

PHOTOGRAPHS BY MAGGIE STEBER

A contemporary rendition, c. 1975, of the traditional Navajo squash blossom necklace features stylized silver petals.

THE IMPERIAL GIFTS WERE FIT FOR A GOD. BELIEVING THE PALE-SKINNED, BEARDED MAN who had come from the east to be the incarnation of the deity Quetzalcoatl, the plumed serpent, lord of the winds, Aztec emperor Montezuma II sent emissaries laden with tribute to greet Hernán Cortés in that fateful spring of 1519. From the temple treasure chambers in the capital, Tenochtitlán, they brought chests full of jewelry, two cartwheel-size disks, one of gold and one of silver, representing the sun and the moon, and more. Aboard his flagship anchored off present-day Veracruz, they also presented him with the gemstone cherished by the Aztecs, used by them in their sacred rituals, and that Montezuma himself affected in the form of necklaces: turquoise. Among the many priceless pieces were a handsome turquoise-encrusted ceremonial shield and a mask representing Quetzalcoatl himself, with a symbolic double serpent of turquoise mosaic coiling across the nose and brows of the deity.

Montezuma, fearing that Quetzalcoatl had returned to claim his throne, hoped by these lavish presents to convince him that his divinity was acknowledged and there was no need to go farther. But the reality was worse than he imagined. The "god" was a Spanish conquistador. Far from stopping Cortés from capturing the capital and taking Montezuma prisoner, the rich gifts only convinced him that a people with such wealth must have what he was really seeking, gold. He scuttled his ships to give his men no choice but to march on to his two-year conquest of Mexico.

Perhaps Montezuma can be forgiven for thinking that turquoise could shield him from harm. For this legendary gem, with kaleidoscopic colors ranging from sky blue to green to yellow and gray, has long been valued for both its beauty and its mystical properties by peoples from Tibet to Arabia and on to Europe and the Americas. It was prized 5,500 years ago by Egyptian kings of the First Dynasty, who had it mined in the Sinai Peninsula under the high patronage of the goddess Hathor, Mistress of Turquoise. Marco Polo remarked on the Chinese emperor's turquoise monopoly in the 13th century, allowing extraction of the best stones only by special order.

But turquoise's hold on the imagination has been due not only to the fascination of its fickle character and changing hues, but also to its supposed magic. Are gods and demons propitiated by it, as Tibetans have long believed? Did it steal its color from the sky, as the Pueblo Indians of the American Southwest like to say? Does it change color to indicate the wearer's health, as many have thought through the centuries?

That's a lot to ask of what is, after all, just a felicitous compound of hydrated copper and aluminum phosphate. Found in only a few places on earth, turquoise—the name comes from the French for "Turkish," because the stone in fact was long imported to Europe from Turkey—is in the class of opaque, colored ornamental gemstones like agates and malachite.

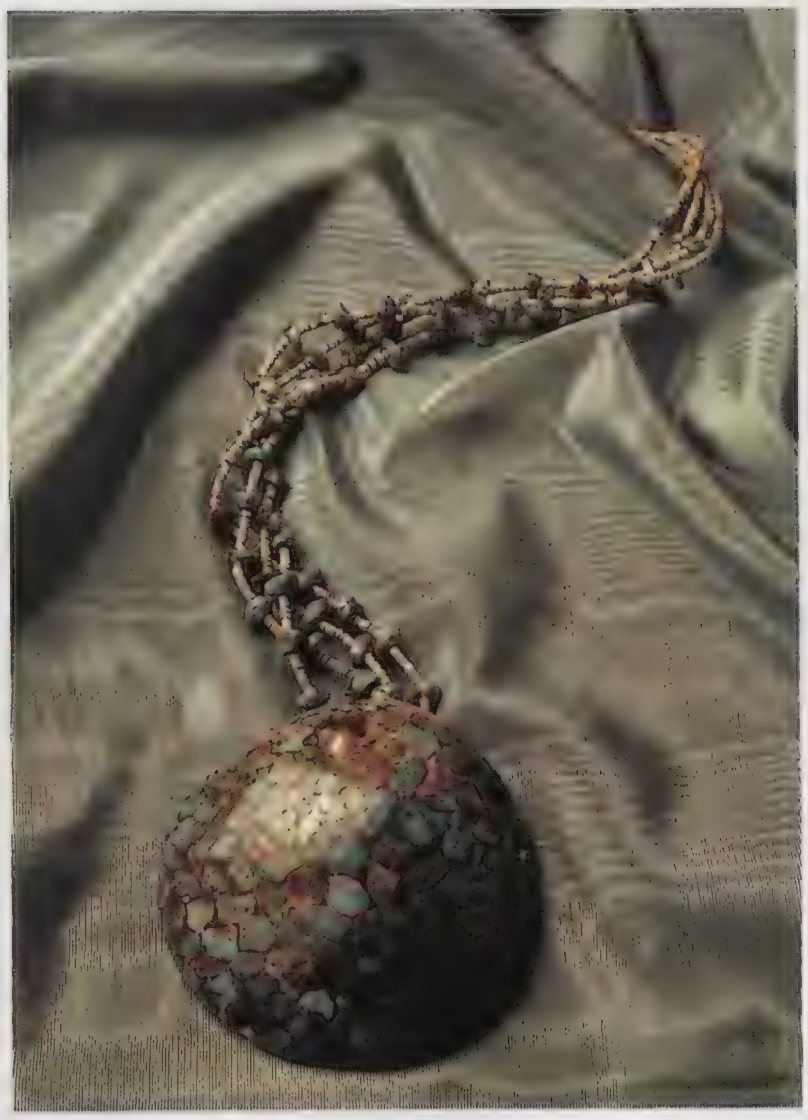
Regarding its legendary splendors with the clinical detachment of the scientist, Jeff Post, curator of the gem and mineral collection at the Smithsonian's National Museum of Natural History, notes that turquoise usually is found in barren, arid parts of the world where copper-rich groundwater seeps into cracks in rocks, forming deposits there over variable expanses of time. "It doesn't have the great luster and brilliance of, say, rubies, sapphires or emeralds," he says, "but its fame and the fascination of its color make it important to our collection."

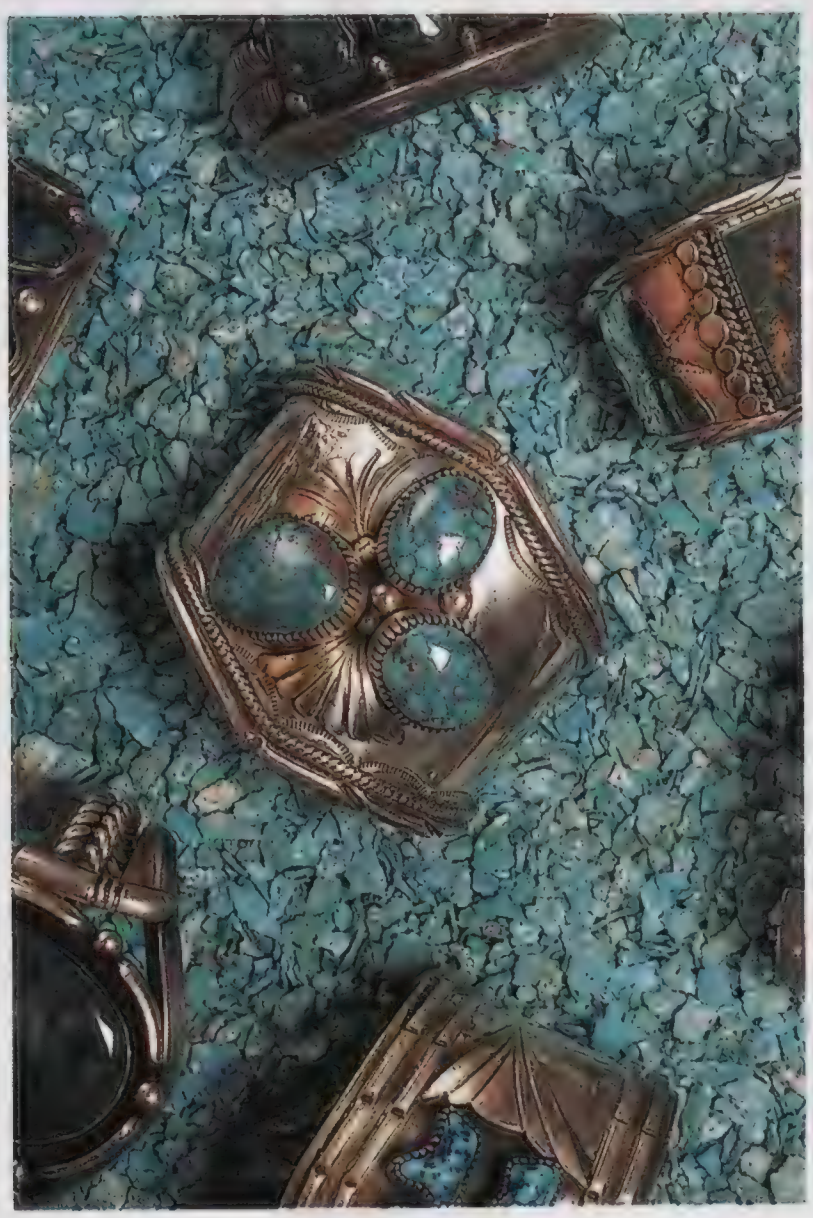
The reference collection in the museum's research area includes tray upon tray of rough, many-hued turquoises from the United States and abroad. "Pale-blue Persian turquoise is still considered the finest, maybe because it was the first ever mined," Post observes. "But personally, I think that the deeper blue of most American turquoise gives it a much more spectacular color."

Turquoise, even if it is produced in a few other countries around the globe, is an integral part of our New World culture. It has been for more than a thousand years. Every time I spot a massive Zuni bracelet with its cabochon-cut turquoises individually bezel set, or a macho Navajo concha belt with bright-blue gems highlighting its heavy silver ovals, or a piece of intense Bisbee turquoise winking in a bolo tie, I know I'm home.

I'm not alone, says Joe Dan Lowry, a lanky New Mexican with an easy smile and an encyclopedic knowledge of turquoise, who runs the private Turquoise Museum with his father, Joe, in Old Town Albuquerque. "Not only is turquoise one of the finest gemstones in the world," he says with obvious conviction, "but its wide variety of colors and styles makes it the perfect emblem of America."

Heir to a great turquoise legacy, Lowry is now painstakingly cataloguing the biggest turquoise collection in the world. The enormous collection—currently locked away in several New





Exemplars of the jeweler's artisanry, sought-after turquoise pieces include, clockwise from top left: a vintage brooch, c. 1930s or '40s; an oyster shell pendant encrusted with mosaic; inlaid belt buckles; a sampling of bracelets.

Mexico bank vaults—had its origin in the decision of Lowry's great-grandfather J. C. Zachary to pick up and head west at the turn of the century. Originally a Pentecostal preacher from Indiana, he became manager of the Villa Grove turquoise mine that opened in Colorado in 1901. His son, J. C. Zachary, Jr., took up the lapidary's trade as a youngster, cutting and polishing the mine's output. Soon he developed a devouring passion for the stone. By the 1970s he was one of the biggest turquoise traders in the United States, combing the Southwest and the world for the finest specimens and managing to assemble several tons of them.

Though all the displays won't be completed for three more years, many fine pieces already can be seen at Lowry's museum. As he shows me around, he tells me about America's turquoise mines. "Nowadays there are fewer than 20 active ones producing in significant quantities, all of them in New Mexico, Arizona, Nevada and Colorado," Lowry says as we walk through a replica of a traditional mine entrance, complete with wooden beams and visible blue veins running along the walls. "Sleeping Beauty, in Globe, Arizona, is considered the largest U.S. mine today," he explains. "People often associate different mines with particular kinds of turquoise, but the fact is that many mines contain veins of various colors. For instance, Blue Gem is known for a rich blue, but it actually turns out stones that range from pale to dark blue, as well as some with greenish tints. Some of the rarest and most costly turquoise, a unique dark blue with black 'spiderweb' tracery, was put out by the Lander Blue mine in Nevada. It produced only 80 to 108 pounds of it before closing."

Trading-post owner Ellis Tanner holds 40,000 turquoise pieces as pawn (right).

The museum displays turquoise specimens in various stages of refinement, from rough material still in the mother rock, or matrix, through polished nuggets. Its centerpiece is the so-called George Washington Stone, a flat, polished, 6,880-carat sky-blue Kingman nugget nearly a foot across that, with some imagination, could be said to resemble a profile of the Father of Our Country.

One of America's finest collections of classic Indian-made turquoise jewelry is in Taos, New Mexico, where the Millicent Rogers Museum occupies a small adobe building on the outskirts of the city. Granddaughter of Henry Huttleston Rogers (a.k.a. the Hell Hound of Wall Street), one of John D. Rockefeller's executives in the Standard Oil Company and a director of U.S. Steel and founder of Anaconda Copper, Millicent Rogers discovered the big sky, clear light and Sangre de Cristo Mountains of Taos in 1947. A striking beauty with a flair for the dramatic, she abandoned a career as playgirl of the Western world—her husbands briefly included Austrian count Ludwig Salm von

Hoogstraeten and Argentine sportsman Arturo Peralta-Ramos—and settled down there for the last five years of her life.

The results of her avid buying of the best and most authentic arts and crafts of the Southwest form the core of the museum. "Out of our whole collection of about 6,000 pieces, including pottery, textiles and other Native American art forms, about 600 pieces are turquoise jewelry," says the museum's executive director, William Ebie. "Most are pieces that Millicent Rogers bought in the 1940s and '50s with great discernment, and represent some of the best ever produced by Navajo and Pueblo craftsmen."

Her taste ran to massive Navajo cluster bracelets resembling brilliant blue sunbursts; heavy concha (Spanish for "shell") belts, with large silver ovals on thick leather setting off a series of bright stones; and squash blossom necklaces with stylized open silver petals, seemingly sprouting from the stones and leading down to the traditional *naja* ("crescent" in Navajo) pendant.

Appropriately enough, the museum is just north of one of the great prehistoric centers of turquoise mining in the New World. Recent studies at Cerrillos have shown it was one of the most important sources of turquoise for pre-Columbian peoples, for whom the stone had great social and religious importance. Archaeologists Garman Harbottle and Phil C. Weigand reported, in the February 1992 *Scientific American*, that as early as A.D. 700, communities like Alta Vista in Mexico were importing enormous quantities of turquoise from Cerrillos for rings, beads, pendants and disk mosaics used in burials. "Turquoise in this pre-Columbian 'Mesoamerican' society clearly was more than an extravagantly valuable possession," they write. "The gem was also a metaphor for life in social and religious realms." The Aztec sun and war god, Huitzilopochtli, the Turquoise Prince, brandished a turquoise snake as a weapon; Quetzalcoatl himself was represented wearing turquoise earrings. Today many 16th-century turquoise Aztec ritual objects are in the collections of the British Museum, including masks, a helmet, a shield—and a knife, fitted with a mosaic-covered handle, used to cut out the pulsating hearts from Aztec sacrificial victims.

BEYOND THAT, THE STONE WAS the medium of a sophisticated trading system throughout what is now the American Southwest, Mexico and Central America. Using an archaeological fingerprinting technique called neutron activation to analyze more than 2,000 pieces from 28 archaeological sites, Harbottle and Weigand conclude that the Cerrillos area of New Mexico was a major source of the turquoise that was so extensively used in Central America, where there were practically no turquoise mines. Well over a thousand years ago, Native Americans were mining the stone and sending it down trade routes stretching through ancient Mexico, from Casas Grandes to Alta Vista, Tenochtitlán, and on to the great Mayan city of Chichén Itzá in the Yucatán.

Trading turquoise in return for merchandise such as copper bells and colorful macaw feathers for ceremonial clothing, the Indians well understood their customers' need of the stone. With its color suggesting sky and water, it has always been central to much of their own mythology, starting at the beginning. One Navajo origin legend holds that when the first man and first woman made the sun, they fashioned it from a stone disk edged with turquoise. A Hopi legend has it that when the tribe emerged from the netherworld, it was

Among designer Ray Tracey's signature creations are his finely wrought bear fetishes, dragonflies and butterflies.

threatened by a flood. Chiefs offered balls of powdered turquoise and shell to the water serpent, and the water receded. Turquoise, long used by the Navajo as talismans for luck and protection against contagious diseases, symbolizes the medicine man's powers. Mount Taylor, a towering, 11,300-foot extinct volcano northwest of Albuquerque, is to them sacred; its Navajo name, Dzil Dotlizi, means "turquoise mountain."

"Turquoise is still sacred to the Navajo," says Ellis Tanner, owner of one of the biggest trading posts in Gallup, New Mexico, near the Navajo Nation reservation. "When they harvest piñon nuts, for instance, they thank the earth by leaving a turquoise in the area of the harvest. And they still count on it for protection from harm and illness."

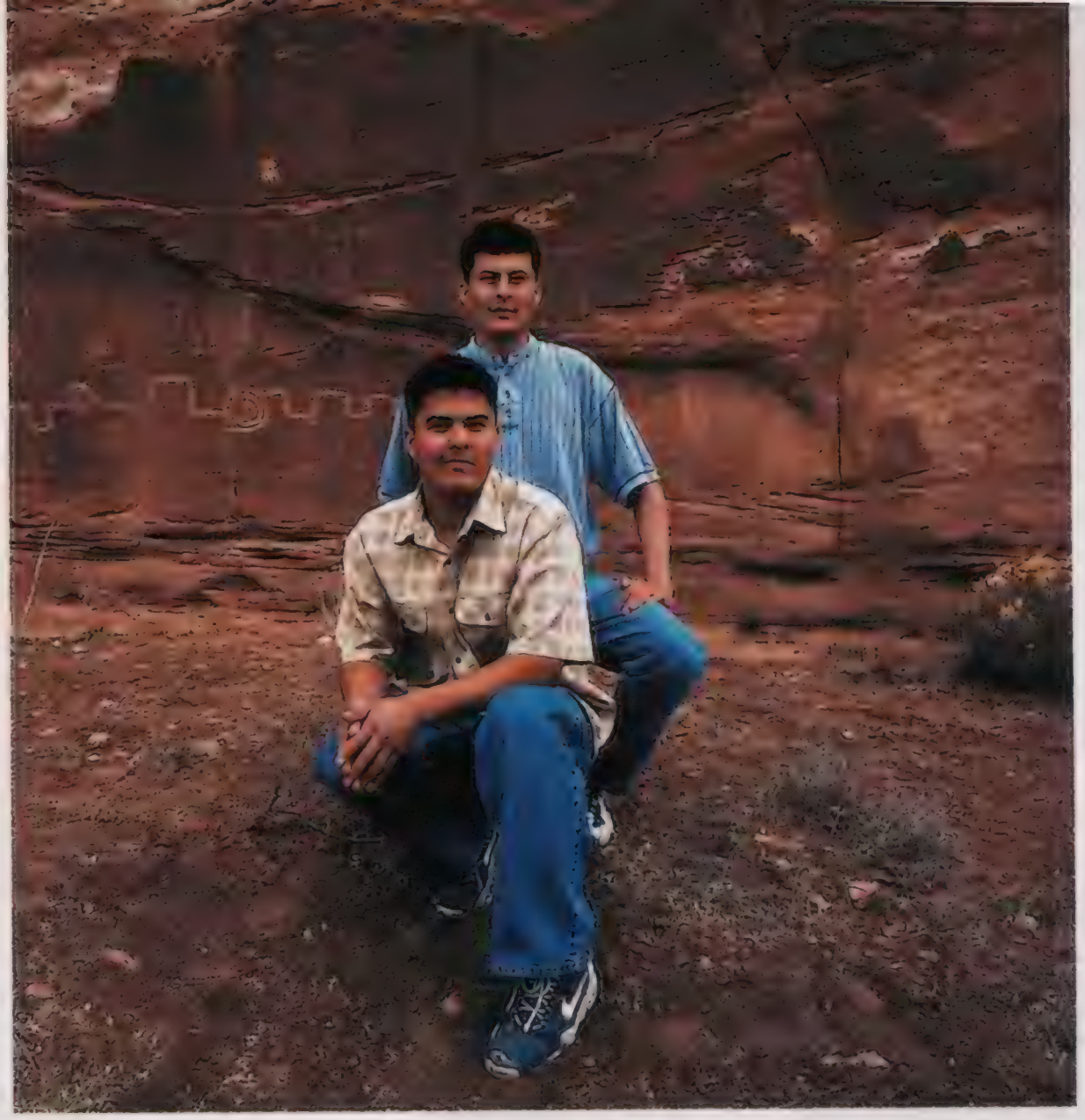
Tanner is proud of his honorary Navajo citizenship and tribal name, A Ye'hee' Yazzie ("little in-law"). He's a descendant of Mormons who came West with Brigham Young and established communities and trading posts all over Navajo country in the 1870s. His emporium, a spacious adobe building on a windy rise with a view halfway across the state, comprises a feed store and grocery. It also handles check cashing and tax returns for his Navajo, Zuni, Hopi, Acama and Laguna customers, organizes the annual harvest of piñon nuts, and buys their output of handmade turquoise jewelry. But one of his main activities is taking turquoise jewelry as pawn. "Out here, people tend to wear their wealth," he says. "They'll come in, buy lunch, groceries and gas for the pickup, then pull a turquoise bracelet off their arm to pay for it. When they get some cash, they come and buy it back."

Behind a thick steel door, past the trading post's rows of leather saddles and showcases holding turquoise jewelry, is Tanner's pawn room. It's an Ali Baba's cave crammed from floor to ceiling with bracelets, rings, concha belts and squash blossom necklaces. Most of the pieces are in clear plastic bags with labels giving the pawn date along with the owner's name and address. "More than 40,000 pieces right now," he says matter-of-factly, "worth about five million dollars. But very little of this pawn goes dead and can then be sold. About 98 percent of it is reclaimed. I like that. It shows how much the owners are still attached to their turquoise." Tanner's own attachment is evident on his right wrist: a bracelet of cabochon-cut chunks of turquoise mined by his grandfather that he's worn for 27 years.

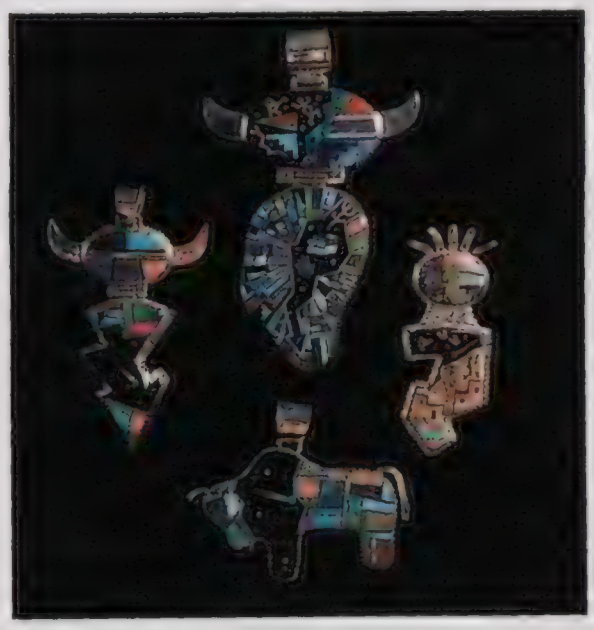
Today the old turquoise mines like Mount Chalchihuitl (an ancient Mexican name for turquoise) in the Cerrillos district no longer produce any significant quantities of the mineral.

Douglas Magnus' 50-acre New Mexico property contains the Tiffany turquoise mine, no longer in operation.

But they still inspire considerable wonder. In 1988, Douglas Magnus, a jewelry designer who has been working in Santa Fe for 30 years, bought the 50 acres that hold the area's old Tiffany, Castilian, Alisa and Council mines. "The Tiffany, which may have had some relation to the New York jewelry store, was first mined by Pueblo Indians before 700 A.D.," Magnus says while we walk around the property that he now calls the Millennium Turquoise Mine. "Manufacture of turquoise jewelry in this area was a major industry by 900 A.D. and probably supplied the Aztecs and other Mexican cultures. As a designer working with turquoise, I must admit it's heady and romantic to have this property. And it's so beautiful." I have to agree, surveying the heart-lifting view, stretching from the Sangre de Cristo Mountains south to the Sandia range.



Navajo brothers Brian, front, and Alvin Yellowhorse produce pieces based on traditions from Anasazi to Zuni (right).



I ENTER THE TIFFANY THROUGH A narrow entrance shored up with weathered beams. Like most turquoise mines, its shafts are only about 30 feet down; many mines, like the nearby Castilian, were open-pit operations. Here and there lie heavy stone hammerheads, or mauls, casual reminders of the prehistoric age when, to satisfy the craving for turquoise, this Cerrillos region was the most extensive mining site known on the American continent. Indian laborers hewed out great chunks of stone and cracked them into manageable pieces. When archaeologists examined the area 100 years ago, they marveled at the scale of the operation. It's estimated that no less than tens of thousands of tons of rock were broken out and processed for nuggets.

As Magnus shines a flashlight over the walls, I can see small, bright-blue dots here and there, and occasionally a thin, blue vein. "This area produced Persian-quality stones of good hardness," he says, spotting a small nugget on the ground and pocketing it for later use in his shop. "After the prehistoric trading system collapsed, it had another boom period of intense mining from 1889 to 1910. The retail value of the stones mined here then is estimated at over a million dollars."

A very large part of the turquoise used today in American jewelry is imported—much of it low-priced but quality stone from China. The American Indian art market, the primary component of the turquoise industry, is said to be worth about $2 billion to $3 billion. That's down from the 1970s, the last high point of turquoise popularity in this country. But with designers updating centuries-old techniques and producing contemporary designs for bracelets, rings, necklaces and belt buckles, many feel the stone is poised for another surge in popularity. "We're in a creative phase in turquoise jewelry making right now," says Magnus, who turns out spare, taut designs for an upscale market—the kind that pays upward of $1,000 for a silver buckle set embellished with luminous turquoise dots—at his studio in Santa Fe. "A lot of us are doing free forms and combinations of other gemstones with turquoise. Right now, some of the most sought-after turquoise colors are things like avocado and lime green."

Alvin Yellowhorse, a 30-year-old Navajo jeweler, might have his Yellowhorse Inlay shop on the reservation, a few dusty miles west of Gallup, but he's on top of the trend. As a teenager he learned the basics of

the silversmith's trade from his father, who sold his jewelry from a table set up alongside old Route 66 near the New Mexico-Arizona border. He spent a couple more years learning the techniques of "channel" inlaid jewelry, in which stones are cut to fit precisely into the handmade form of a bracelet, earring, pendant or other piece. "Although I do contemporary designs, they're inspired to some extent by the prehistoric drawings done by my Anasazi ancestors," he explains. "I love the thousands of shades of color you find in turquoise. But I also use other stones, including some imported from Australia and Italy, to build a complex composition of colors and textures."

In the 1940s and '50s, socialite Millicent Rogers (top) amassed the turquoise jewelry collection that is now housed in the Taos museum that bears her name.

AS I WATCH, YELLOWHORSE takes a small piece of turquoise and holds it to his jeweler's cutting wheel, thumb and forefinger only millimeters from the whirring, diamond-tipped blade. "I'm like an octopus, I grow fingers back," he quips as he nimbly carves the piece to the rough size and shape he wants. Then he finishes it on a succession of five grinding stones with progressively finer surfaces of diamond dust, with up to 50,000 particles per square inch. In five minutes he has a perfect fit and slips it into its slot in a silver inlay bracelet.

In nearby Gallup, Ray Tracey is another designer who knows how to mix and match turquoise to produce a contemporary look. A Navajo who was raised on the reservation at Ganado, Arizona, Tracey, 46, began making jewelry as a child and later sold it at flea markets for a living. At age 23, the good-looking young man heeded the siren call of Hollywood and acted in films for ten years, then shucked that to return to designing jewelry in Gallup. Today his creations, produced by several dozen Navajo artisans in his workshops, are sold through some 500 jewelry shops nationwide, with other sales outlets in places as far away as France and Germany.

His smooth, understated contemporary pieces feature things like stylized arrowheads and bear fetishes. "I love the colors of turquoise," he says. "I use it in reverence for what it has meant to my people. But I'm not a purist about it; I'm market-aware enough to know what the public wants today."

One thing much of the public—the part that doesn't understand the real charm of turquoise—wants is "stabilized" stone. "The fact that natural turquoise, being porous, changes color over time, and after contact with body oils, perspiration, dirt and soap, disturbs some people if they don't know it's normal," says Tracey. That, plus the fact that only a small proportion of turquoise is naturally hard enough to be cut and polished to a high luster, means that many producers work with a certain number of treated stones.

Experts like Joe Dan Lowry estimate that up to 85 percent of all turquoise mined today is in the form of chalk or low-grade stone. This is then treated with mineral oil, paraffin or epoxy resin to deepen the color and make the stone hard enough to work. It also stabilizes the color permanently. Unfortunately, that removes one of the stone's age-old charms, a symbiotic relationship between it and its owner, revealed by its changing color. This was what the 17th-century English Metaphysical poet John Donne described when he wrote of a "compassionate turquoise that doth tell, / By looking pale, the wearer is not well."

"Electric Slide" © Don Julian. License courtesy SSV Music.

©1999

it's gas, it's electric boogie-oogie-oogie-oogie

The Toyota Hybrid Car. Introducing a breakthrough in environmental technology. The Toyota Prius combines a super-efficient gasoline engine, an electric motor powered by a battery that never needs recharging, and an intelligence system that knows when to use which. The world's first mass-produced hybrid car — cleaner, affordable, and coming soon to America. Ready for the next step?

For more information, call 1-800-GO-TOYOTA or visit www.toyota.com/ecologic

today ▸ tomorrow ▸ **TOYOTA**

Geraldine Yazzie, a Navajo woman wearing traditional dress, displays a wealth of turquoise ornament.

As long as it's labeled and priced accordingly—in the same league with costume jewelry—and not sold as natural turquoise, treated stone is considered legitimate by craftsmen, dealers and the Albuquerque-based Indian Arts and Crafts Association (IACA), which works to keep the market honest. Still, it's anathema to purists. "They call it 'stabilized,' 'dyed' and other fancy names, but as far as I'm concerned, it's just doped turquoise and I don't like it," says dealer Manny Goodman, echoing many who want only the real thing.

But the real thing is getting harder to spot all the time. Skillfully "improved" turquoise can fool even the experts, because the back of a mounted stone isn't visible and a thorough gemological test using heat risks destroying it. And then there's plastic. "A lot of turquoise jewelry being sold today is 100-percent plastic," laments Cheryl Ingram at the Silver Sun shop in Santa Fe, as she shows me blocks of sky-blue plastic available in artist's supply stores. "We don't like to admit it, but the quality of plastic nowadays is getting so good that even we dealers sometimes have trouble spotting it visually. It takes a high shine and is easy to work, like cutting butter. And of course it costs the maker a fraction of real turquoise. If people want to buy plastic, that's their business, but they should know what they're paying for."

Treated stone will give off a faint odor of oil, paraffin or plastic when rubbed vigorously or heated. "When buying turquoise, get a written guarantee from a well-known, reputable dealer that the piece is natural, saying what mine it came from and who made it," advises Roger Wilcox, executive director of the IACA. "Also ask for a signed certificate of authenticity, and look for the IACA logo on the shop door. If the price seems too good to be true, it probably is."

Joe Dan Lowry points out that the term "turquoise" by itself can include treated and even artificial turquoise. "So there's really only one question to ask: Is this natural turquoise? If it is, you're looking at more than just another gemstone. Turquoise, in its many hues and variations, reflects our country's endless individuality, changeability and diversity. It's really a perfect metaphor for our culture."

Joseph A. Harriss is based in Paris. Photographer Maggie Steber works out of Manhattan.

Think calcium
is all you need
to keep your
bones strong?
Think again.
As a woman over 60, there's something you may be interested to know. While calcium with vitamin D is important for bone health, it often isn't all you need to prevent osteoporosis.
That's why it's important to ask your healthcare professional if a Bone Density Test should be part of your health evaluation. It's a simple, painless test that can measure the health of your bones. So if your bones are thinning, you can find out about treatment options to help strengthen them, and continue to lead an independent life.
Ask your doctor if a
Bone Density Test is right for you.
993589(1)-04-FOS-CON
MERCK

DECEMBER A.D. 1

TEMPUS

millennium 2000

IN THE YEAR 1 AUGUSTUS LET THE GOOD TIMES ROLL

THE YEAR 2000 IS ALMOST UPON US, BUT WHAT IN THE (WESTERN) WORLD WAS HAPPENING WHEN THE COUNTING BEGAN?

AS THE SECOND MILLENNIUM OF the Christian Era draws to an end, the editors of *Time* will be pondering their choice for the outstanding figure of its last year, Man of the Year A.D. 1999, to put on the cover of the appropriate issue. What if they had to add a choice for the first year of the era, Man of the Year A.D. 1? More specifically, Man of the Year A.D. 1, in the Western world, this being where the reckoning of time from the birth of Christ was invented and took hold. Our system of dating was thought up by a learned Christian monk, Dionysius Exiguus (Little Dennis), who lived in Rome around the close of the fifth century A.D. and the beginning of the sixth. The

BY LIONEL CASSON ♕ ILLUSTRATIONS BY JOE FARNHAM

system in his day had been instituted by Diocletian, a Roman emperor infamous for his merciless persecution of the Christians. Dionysius, deeming it no fit system for Christians, devised a new one that was, and, as we all know today, chose the birth of Jesus Christ, as he calculated it, as his starting point (SMITHSONIAN, February 1999).

In the year Dionysius would choose to start with, one man bestrode the Western world like a colossus. He was not Shakespeare's Julius Caesar, whose bestriding had ended abruptly on the Ides of March, 44 years earlier, but his grandnephew Augustus, whom Julius Caesar had named as his heir. Augustus was a youth of 18 when Caesar's murder propelled him into the Roman political arena; he was only 32 when Mark Antony's suicide in 31 B.C. left him overlord of territory that reached from Spain to Syria. He transformed that territory into the Roman Empire, with the reins of power securely gathered into his own hands. He put in place the machinery of government that ran it; he created the army and navy that protected its borders. He did such a good job that the Roman Empire endured for centuries after, the first two of which were the centuries of the celebrated Pax Romana, the longest period of peace the Western world would ever enjoy.

The year 1 was the 30th in the reign of Augustus, who ruled over the empire with absolute power. By this time the government he had put in place was operating smoothly. The curtain had also gone up on the prosperity that peace can bring. The whole Mediterranean was now open to commerce, and its sea-lanes were safe, since the Roman navy, with no enemies to fight, concentrated on getting rid of pirates.

Massive amounts of commodities moved over the waters in vessels that could be as large as the East Indiamen of the 18th century. Grain was the prime commodity, for making the bread and porridge that were the basis of the ancient diet. Olive oil and wine were runners-up. Olive oil was shipped in quantity because, for Greeks and Romans, it was considerably more than a food item. It did what electricity and soap do for us—people burned it for light in lamps and anointed themselves with it as a cleanser. And wine was shipped in quantity because it was more than something to drink with meals. They took a cup of it when we would have one of coffee or tea, both unknown in antiquity. Since whiskey, brandy and other alcoholic beverages were equally unknown, the sole drink at all festive occasions was wine. The Romans diluted it liberally with water—the view was that only barbarians and sots took it straight—but despite this, they managed to get tight; some famous figures, such as Alexander the Great and Mark Antony, were notorious drunks, and so was one of the gods—Hercules, who imbibed as mightily as he fought.

The Romans diluted their wine liberally with water—despite this, they managed to get tight.

A shipper could prosper handling cheap and bulky commodities like oil and wine. If he hankered for a richer return, he went in for importing silks and spices and similar expensive luxuries from far-off India—goods whose value made a vessel a veritable treasure ship. Whether dealing in olive oil or exotic silks, the trader got the sizable sums he needed to finance his venture through maritime loans, in which he pledged as security the cargo he would buy with the borrowed funds. He would have to pay interest of 30 percent or better; no matter, the profit he could turn when he sold his goods easily covered it. Besides, under the laws governing maritime loans, he repaid only after the cargo arrived safely home. If the ship

went down, the lenders stood the loss. Investors were ready to take the risk. In ancient Greece and Rome, where real estate rarely went on the market, where there were no corporations, and such things as stocks and bonds did not exist, maritime loans were among the few ways available to make a financial killing. There was no shortage of men willing to stake a shipper to the equivalent of hundreds of thousands of dollars, even though a bit of bad luck with wind and weather might wipe out the total investment. For, if the ship came in, and most of the time it did, they reaped over three times what they would have netted on an ordinary loan.

Though the big money was to be made on the sea, in those peaceful times the land also offered good opportunities. Tradesmen and craftsmen could do very well—and manufacturers especially well. One of the major areas of manufacture was the molding and firing in quantity of clay utensils. These included not only small items, such as oil lamps, dishware and cookware for household use, but also the huge clay jars, or amphorae, commonly standing about five feet high, that served as containers for shipping oil, wine and other foodstuffs, since wood was too expensive to use for barrels. Huge numbers of these jars were needed: the ordinary oil or wine freighter held 3,000 or so of them, and a large freighter, as many as 10,000. If several vessels arrived at a port to load, it could well take tens of thousands of amphorae to fill the holds. The manufacturing of such numbers of large jars was done, like all other manufacturing in ancient times, by hand, in small factories. The organization and direction that made it possible must have been ruthlessly efficient.

Not only the many who prospered but also their less fortunate neighbors enjoyed the public amenities supplied by the towns or cities they lived in. A town was not a proper town, the Romans felt, unless it offered its denizens paved streets, a water supply, which often had to be brought in over aqueducts from miles away, and public baths with hot, warm and cold pools—baths that were open to everyone, rich or poor. In A.D. 1, the poor in Roman cities and towns drank better water and washed more often than many of their counterparts in American cities and towns will in A.D. 2000.

Another amenity the towns and cities supplied free to the denizens was entertainment, including the Roman spectator sports par excellence, chariot racing and gladiatorial combats. Chariot races were part of the program at official religious festivals; gladiatorial combats were also put on, not as a regular feature but as added attractions paid for by ambitious politicians or, in Augustus' time and after, by the emperor. Augustus, in the course of his reign, gave the public eight gladiatorial shows in which no fewer than 10,000 men fought—an average of 1,250 per show. One of the eight took place in 2 B.C., and it must have been a big one, for it was part of the ceremonies at the dedication of the temple of Mars Ultor, "Mars the Avenger," which the emperor erected in thanks for his victory in the decisive battle against Caesar's assassins, a vital step in his path to the throne. In his day, gladiatorial contests were no longer necessarily associated with religious festivals, although chariot racing continued to be. In either case the spectators were unaffected: admission was gratis.

Health care was, if not free, at least within the reach of

the poor. The source of the benefaction in this case was not the government but religion. The payment required was a donation to the god, and he compassionately accepted whatever he was given. The god was Asclepius, whose sanctuaries, equipped with the appropriate buildings and staffed by priests with the appropriate training, provided the services of a medical center. Patients from all over flocked to them because there, they knew, their case would be handled by an infallible doctor—the god himself. After receiving a solemn ritual preparation, they passed the night in a sacred dormitory, and he appeared in their dreams and prescribed the treatment to be carried out. If the dream was unclear, the temple priests were there to offer an interpretation. From the patients' accounts the priests could usually prescribe standard remedies such as a change in diet, exercise, medicines, purging, bleeding. None of these cures would have helped much with the two most prevalent maladies in antiquity, malaria and tuberculosis, and probably did little for many of the other maladies that confronted the priests, but what unquestionably helped in all cases was the psychological effect of the impressive procedure.

A major contributor to the bright days of A.D. 1 as well as the years before and after it—the thriving economy, the flourishing towns and cities with their public services and entertainment—was the security the empire enjoyed, thanks to the armed forces. Before Augustus' time, troops were recruited and warships launched only when the need arose; one of Augustus' greatest accomplishments was his establishment of a standing, professional army and navy. Both were of top quality. The members were all volunteers, who eagerly signed on for hitches of at least 20 years because the services gave a man status, lodging, good pay and benefits on discharge to boot. The biggest item in the army's budget was the payroll, since the men bought their own weapons and food. The biggest item in the navy's budget was the ships. The standard man-of-war was the trireme, a combat galley large enough to accommodate almost 200 oarsmen, arranged in three superimposed lines, and marines, who boarded other vessels or repelled boarders. Some combat galleys were larger, with even more oarsmen.

The fleets had a total of several hundred such vessels, and each represented a sizable outlay. The timber that went into each combat galley was the finest, and to ensure proper strength in the hull, the construction was more like cabinetwork than carpentry; the planks were fastened to each other with thousands of closely set mortise-and-tenon joints, each, of course, painstakingly hand cut.

The navy had a sizable payroll to meet, too, for the rowers, contrary to a common misconception, were not slaves; they were freemen who, though they received less than the soldiers of the army, still got a fair wage. (The galley slave does not enter history until long after the end of the ancient period.) The navy had no trouble recruiting the thousands of men it needed to pull the oars of its galleys; they came from Rome's subject provinces, and for them a strong inducement to join up was the discharge benefit—Roman citizenship.

For rowers in the navy, an inducement to join up was the discharge benefit—Roman citizenship.

An aspect of life that benefited enormously from the security the army provided on land and the navy on the sea was tourism. Before Augustus' day, chronic warfare and generally unsettled conditions discouraged sight-seeing. Besides, few were wealthy enough to go in for it. In the years of the Pax Romana, the conditions were propitious, and the general prosperity made the number who could afford to travel far greater than ever before or for centuries thereafter. And travel they did, even though it was not easy. Getting anywhere overseas meant booking deck passage on a freighter (there were no passenger ships as such), while getting anywhere overland meant jolting along in a springless carriage. Moreover, once on the road, travelers were more or less out of communication with home. The only organized postal service in existence was strictly of and for the government. A private person who wanted to send a letter had to find someone heading for the desired destination who was both

willing to carry it and to take the trouble to locate the addressee—no easy task in an age when there were few streets with names, none with street signs, and no such thing as house numbers.

Tourists willingly undertook the hardships. The attraction was, as it often is today, the magnetism of relics of the past. We trek to where Washington spent a night, where Monet lived, where Napoleon is buried. They trekked to where Alexander the Great spent a night, where Socrates lived, where Achilles was buried. We flock to England for a visit to Shakespeare country; they flocked to Troy in Asia Minor for a visit to Homer country (where they were shown the beach along which the Greek ships were pulled up, the plain where Hector and Achilles rampaged, the cave where Paris gave his fateful judgment, and so on). They went to Egypt to see the very things we do—the Pyramids, the great Sphinx, the Valley of the Kings. We know many of the specific spots they visited because they had the same habit people have today, of scribbling their names on the sites they visited. One graffito, left by a Roman traveler on the wall of the Temple of Isis on the island of Philae, far up the Nile at the First Cataract, runs: *L. Trebonius Oricula hic fui*, or "I, L[ucius] Trebonius Oricula, was here." The ubiquitous Kilroy of World War II fame, had his native tongue been Latin, would have used these words. Trebonius adds the date: the eighth day before the Kalends of April in the 13th consulship of Augustus–which works out to be just two years before the beginning of our era, March 25, 2 B.C.

In A.D. 1, the poor in Roman cities washed more often than many Americans will in A.D. 2000.

And, like his modern counterpart, the ancient tourist came home with souvenirs of his travels. One of the major sights of Antioch, for example, was a famous statue of Tyche, the goddess of fortune. A multitude of miniature copies of it have been found, from two inches to a foot high and in all sorts of materials—glass, clay, bronze, silver, stone; they were tourist gimcracks, the ancient equivalent of the miniatures of Michelangelo's *David* that are peddled in Florence today, or of the Eiffel Tower that are sold in Paris. It was the trade in such souvenirs that caused so much trouble for Saint Paul when he was in Ephesus: one of the city's great sights was the Temple of Artemis, and the silversmiths who made little Artemis shrines for sale to visitors were upset at the potential effect on their business of his preaching against the gods.

In foreign affairs, over which Augustus did not have the control he had over domestic matters, he experienced some failures. Although he had the finest army in the Western world at his command, in maintaining the peace he preferred diplomatic maneuvering and negotiation to force. In 4 B.C., for example, he faced potential trouble in Palestine, a place where maintaining the peace was always a delicate business. Herod the Great, king of the region, had managed to do it for more than three decades by combining ruthless handling of enemies with deft handling of religious and political divisions. But his death in 4 B.C. removed him from the scene, and problems soon arose. He had married ten times and sired numerous sons, and though he killed off a number of them, enough were left to start a wrangle about the succession. Augustus settled the argument Solomonically by dividing the kingdom among the three eldest. His solution proved to have momentous consequences: the son who acquired the southern part, which included Judea and Jerusalem, got himself so disliked that in A.D. 6 Augustus removed him, sent him into exile, and annexed his territory to the empire as a province governed by a Roman official. The sixth such official was Pontius Pilate. As we know, Pontius Pilate would make his own contribution to the year 1. In A.D. 30, he would preside over Jesus Christ's condemnation to death by crucifixion, thus starting the process that would lead the little Christian monk, Dennis, 500 years later, to choose Christ's birth as the starting point for his new, Christian era.

One area where Augustus couldn't resort to diplomacy or negotiation was along the northern frontier between Gaul, which was part of the empire, and certain lands adjoining it that were held by German tribes, who consequently had easy access for raiding Gallic villages and took advantage of it. Here he had to use the army, and in the opening years of the century, operations went well. Then he chose to put in charge the wrong man, Quinctilius Varus. In A.D. 9, Varus led a force of some 20,000 strong straight into a German trap in the Teutoberg Forest, and it was wiped out; he committed suicide. The Germans captured the standards of three legions, the greatest of all humiliations for the Roman army. After Augustus got the news, for months he let his hair grow wild, didn't shave, and every so often would bang his head on a door screaming, "Varus! Give me back my legions!" The defeat had its long-term consequences: it contributed to keeping much of Germany out of the embrace of the Roman Empire, and as a result, Germans today speak their own language and not some version of Latin.

In A.D. 9, Varus led a force some 20,000 strong straight into a German trap in the Teutoberg Forest, and it was wiped out; he committed suicide.

The border to the east was also a source of worry, and here Augustus managed to achieve what he was after with diplomacy. Across the border was Rome's only rival power, the Parthian kingdom, occupying the ancient land of Persia beyond the Euphrates River. The Parthians were formidable because of their army. The Romans relied on a highly trained, well-disciplined mass of infantry whose prime weapons were spear and sword; the Parthians relied on lightly armored cavalrymen whose prime weapon was the bow. One of their specialties was the "Parthian shot": they would feign retreat and, as they galloped away, suddenly fire backward at unwary pursuers. In 53 B.C., a Roman general ventured across the Euphrates with a big army and senselessly chose a flat plain on which to meet the Parthian force that came to stop him. Its cavalry, shooting at his infantry masses like ducks on a pond, administered one of the worst defeats Rome had ever suffered; the Parthians went home with the Roman legionary standards and thousands of prisoners. For decades the Romans agonized about the situation, much the way we did about Americans taken captive during the Vietnam War. Finally, in 20 B.C., Augustus, mingling diplomacy with a show of force, succeeded in getting everything and everybody back.

The Parthian kings, checked by Rome in the west, expanded eastward, into India. Today India, with all its linguistic and religious and cultural divisions, is at least a political unit; at the beginning of the Christian Era it was not even that. The Parthians held the northwest, invaders from Central Asia the rest of the north, a powerful native dynasty the center, and a number of local rulers shared the south. Under this political diversity, life was recognizably Indian: the population was split, as it had been for centuries, into castes; women committed suttee; rice was the staple diet (resident traders from the west, longing for bread, used to include a bit of grain in their shipments from home); there was the welter of familiar religions—Buddhism, Jainism, Hinduism.

Beyond India lay the Chinese empire, bracketing the known world on the east as the Roman Empire did on the west. These two great states knew of each other, but only barely, and what contacts they had were indirect. Western traders were aware that the silk they bought in India to ship to the Mediterranean came from China: as one of them wrote, "There is a very great inland city called Thina from which silk floss, yarn, and cloth are shipped. . . . It is not easy to get to this Thina, for rarely do people come from it and only a few." He probably got his information from Malayan or Indian seamen, who plied the waters between China and India, or from Central Asian caravaners, who plied the routes on land. It was too bad for the Western world that relations weren't closer, for it might have gotten some useful things much earlier than it eventually did. Chinese smiths, for example, knew how to make cast iron, Chinese laborers had that humble but supremely efficient instrument, the wheelbarrow, for carting loads, and Chinese children were having fun flying kites; the West knew none of these until the Middle Ages and even later.

In A.D. 1, the Roman Empire, having been brought into being by Augustus less than 30 years earlier, was young and vigorous. There was peace; commerce and industry prospered; people, including the rank and file, enjoyed urban amenities and free entertainment. Rome's neighbors were quiet, except for the Germans, and the trouble they were causing would not become serious until later. The credit goes chiefly to Augustus—Man of the Year, even as he had been for more than a decade before and would be for more than a decade after.

Lionel Casson, a professor of classics at New York University, has often written about the ancient world for SMITHSONIAN. *Joe Farnham is inspired by old-time baseball, the classics and the art of N.C. Wyeth.*

LIFE IS TOO

You outgrew your stroller. You outgrew your first bike. You outgrew your car. It happens. Life is too big to fit in a car. That's why we don't make cars. We believe that big lives need the big cargo space of an Isuzu Trooper. And if you outgrow 85 cubic feet of cargo space, well, good luck. Isuzu. No Cars.

ISUZU

Go farther.

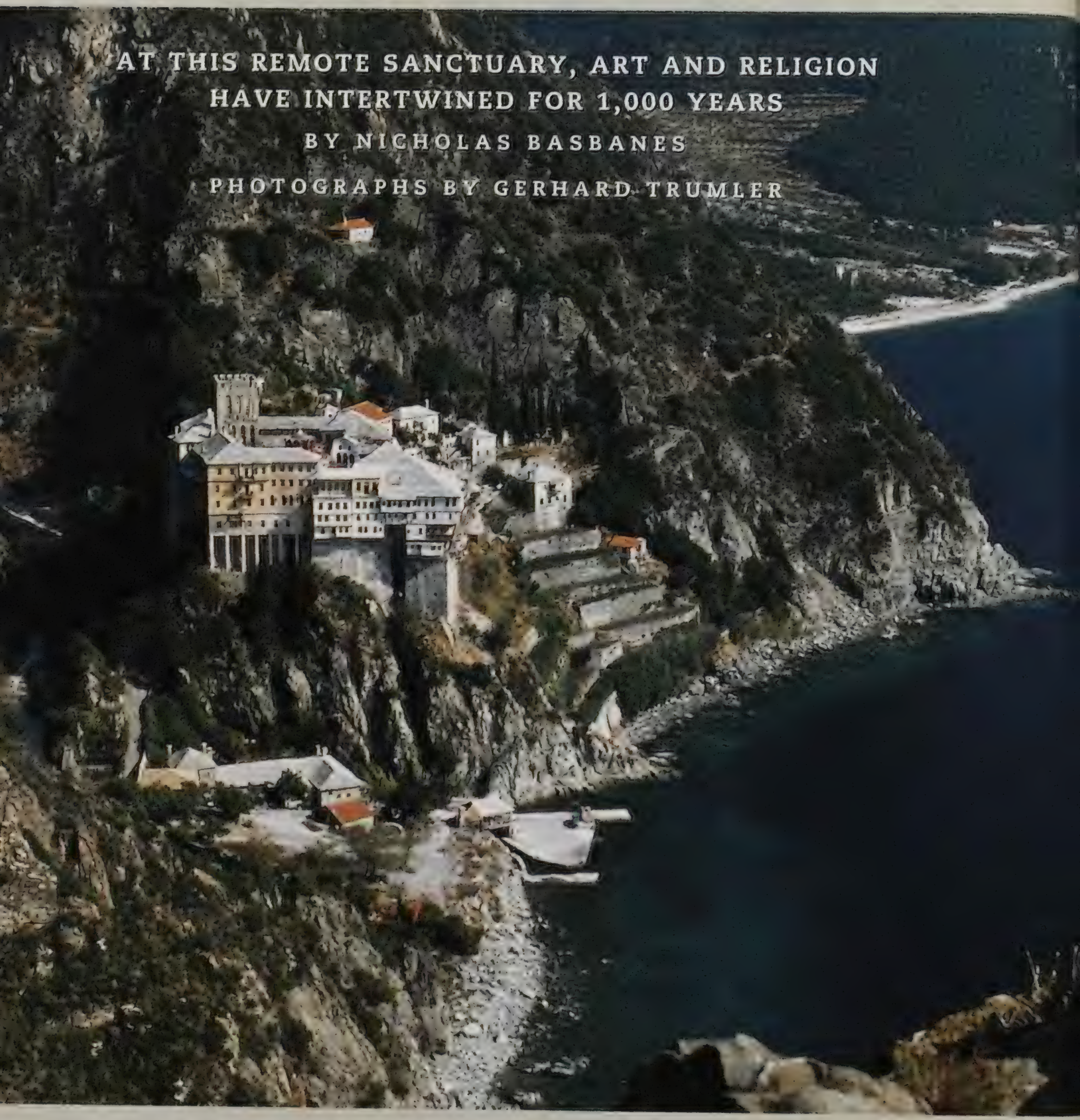
BIG FOR CARS

800 726 2700 / www.gofarther.com

©1998 American Isuzu Motors Inc. "Go farther" is a trademark of American Isuzu Motors Inc.

MOUNT

WHERE "EVERY STONE

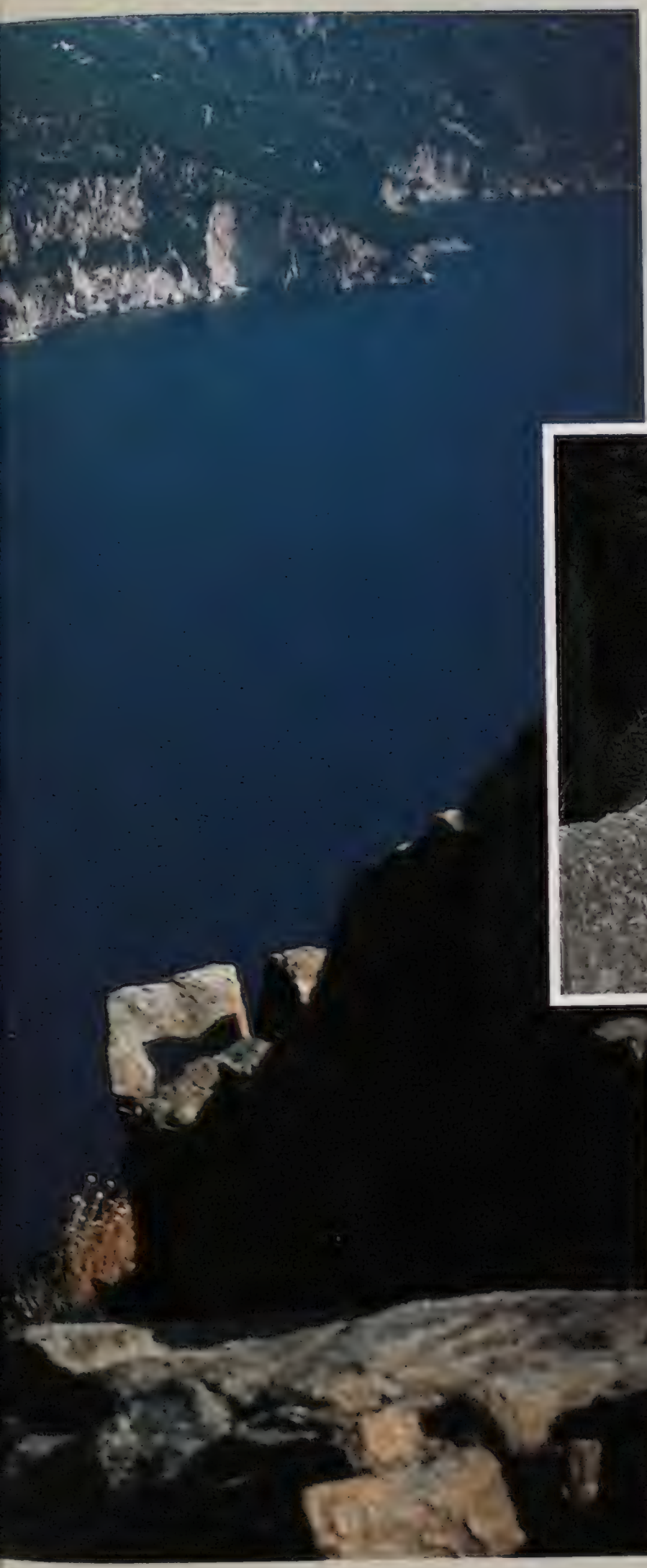


AT THIS REMOTE SANCTUARY, ART AND RELIGION HAVE INTERTWINED FOR 1,000 YEARS

BY NICHOLAS BASBANES

PHOTOGRAPHS BY GERHARD TRUMLER

ATHOS, BREATHES PRAYERS"



AS MORNING SERVICES AT THE GREAT MONastery of Vatopedi entered the fourth hour, the sky outside the 1,000-year-old church, or *katholikon*, remained cloaked in darkness. Bearded men in black robes moved deliberately about their rituals, chanting hymns from sacred texts, kissing icons, venerating cherished relics, burning incense, crossing themselves repeatedly, all the while praying for the salvation of humanity and the safe deliverance of their souls. Another 90 minutes would pass before the brotherhood gathered quietly in the refectory for a breakfast of braised vegetables, freshly baked bread, thick slices of feta cheese, tangy black olives, water from the nearby springs and a few sips of red wine.

The signal to wake up that day, like every other day for the 2,000 Orthodox Christian monks who live in the Holy Community of Mount Athos, had been sounded by the peri-

The 14th-century Dionysiou Monastery (left) hugs the cliffs over the Aegean. In an Easter procession (above), monks carry a *semantron*, a wooden beam used as a drum to call worshipers.

The Athonite monasteries have the richest collection of Byzantine art held anywhere in the world.

odic ringing of bells in the towers and the rhythmic beating of a huge wooden beam, a *semantron*. At 3:30 A.M., the monks were chanting from their psalters by the glow of flickering candles, casting long silhouettes on inlaid marble floors made smooth by centuries of use. When daybreak finally arrived, narrow sunbeams entered the nave through clear glass windows, appearing at a juncture in the liturgy where the faithful celebrate dawn and the coming of light into the world.

Occupying the easternmost of three promontories attached to the Chalkidiki Peninsula, the Holy Mountain (Agion Oros) juts 35 miles into the Aegean Sea. It begins near the port city of Ouranoupolis (City of Heaven) on ground that is low and flat, but gradually rises into a chain of rugged peaks and ravines that end abruptly with Mount Athos itself, a sheer formation of marble and limestone that drops dramatically down to the sea from a summit of 6,660 feet. Although the territory is connected to the Greek mainland by a narrow isthmus, there is no direct access by road, and visitors must travel 1½ hours by ferry from Ouranoupolis to the port of Daphne to get there.

The all-male theocracy consists of 20 sovereign monasteries, a dozen smaller dependencies called sketes, a few hermetic caves burrowed into the sides of mountains and reachable only by chain ladders or treacherous pathways, and many solitary huts that are home to the most ascetic souls of all. It is a place, as one monk puts it, where "every stone breathes prayers."

A semiautonomous state, the 223-square-mile monastic republic is governed by an assembly of monks who work with a civil governor responsible to the Greek foreign ministry. Two flags fly in tandem on the Holy Mountain. One bears the familiar blue and white colors of Greece; the other is a bright-yellow banner emblazoned at the center with a two-headed Byzantine eagle, perpetuating the symbol of a Christian empire that collapsed more than 500 years ago with the loss of Constantinople to the Muslim Turks.

To suggest that Mount Athos is little more than a quaint anachronism on the periphery of modern civilization, however, is to entirely miss the point of its existence. Thousands of cultural riches are sheltered on the Holy Mountain, where artistic expression and constant prayer have come together synergistically for more than 1,000 years. All the artworks and manuscripts gathered there were produced over the generations by craftsmen, scribes and illuminators to express their devotion. In a powerfully palpable way, the monks have perpetuated a heritage that was threatened with extinction during periods of great cultural turmoil.

Although the Byzantine Empire was lost forever, its ideals were kept alive some 200 miles west of the fallen Constantinople on Mount Athos. Many monks fled there, taking along whatever icons and manuscripts they could carry, and adding them to the treasures already assembled over the previous five centuries. Painters and artisans followed as well, and produced work that has become stylistically distinctive.

The Athonite monasteries have collected an estimated 20,000 portable icons and 15,000 manuscripts over the decades, the richest concentration of Byzantine material held anywhere in the world. The churches and refectories are architectural triumphs in their own right, and inside these ancient buildings, frescoes cover a total wall surface of more than 300,000 square feet. Mosaics adorn the altars and interior walls of the monasteries. Many more precious objects—wood carvings, jewel-encrusted reliquaries, holy medallions, illuminated manuscripts, intricately crafted pectoral pendants, crosses, candlesticks, votive lamps—are safely locked in sacristies, treasure rooms and libraries, where they are rarely seen by outsiders.

Christian monasticism dates from the fourth century and involves a retreat into solitary life in order to achieve communion with God. Prevailing tradition holds that Mount Athos is not part of this world, but separate from it, a "heaven on earth," which is why every man who moves there takes a new name and eschews discussing his past. "He who is a monk keeps himself apart from the world and walks forever with God alone," is how Symeon the New Theologian (c. 949-1022) characterized the calling. Archimandrite Ephraim, the current abbot of Vatopedi, offers a contemporary description: "On Mount Athos, men are not born; here they die. They pray and die, but the preparation for death, like death itself, is full of life." The ultimate goal of every man, as Saint Paul put it, is to "pray without ceasing," even during times of rest. "I sleep," goes one injunction, "but my heart is awake."

For all the artistic wonders it has preserved, the Holy Mountain is not a museum, and the idea of playing host to sightseers is anathema to the monks. Male visitors of all

A monk at the Romanian Prodromou Skete is surrounded by treasures: frescoes, silver icons and intricate wood carvings.

ALL: GERHARD TRUMLER/AGE FOTOSTOCK AMERICA, INC.

A monk unloads his day's catch (above) at Xenophontos. A mule carries wood (right) gathered by a monk to sell or to use for fuel at his skete at Kerasia.

Opposite: A monk (top) prepares fish for Easter dinner at Great Lavra. A typical meal (bottom) of beans, leavened bread, tomatoes and stewed pears is ready to be served.

faiths are welcome, but they come as pilgrims, not tourists, and only 110 "residence permits" are issued each day by patristic officials in Ouranoupolis. Some 35,000 men make the trip each year, typically limited to a four-day stay. This document entitles the visitor to full hospitality: a bed with fresh sheets, clean towels and two wholesome meals a day.

To the displeasure of feminists worldwide, women are not allowed on Mount Athos. They were formally banned in 1045 when Emperor Constantine IX Monomachus decreed that the Holy Mountain be set aside for the exclusive veneration of the Virgin Mary, the protectress of the territory. According to one tradition, Mary was en route to Cyprus to see Lazarus when a sudden storm forced her ship to land near the present site of the Iviron Monastery. Overwhelmed by the beauty of the land, she is said to have asked for, and received from her son, the Holy Mountain as "your inheritance and your garden."

The prohibition imposed against all other females, which is known as the "avaton," extends to various domestic animals as well, although there are numerous mules, to be sure, and cats of both sexes roam the territory—kittens can be seen sauntering everywhere. The cats are tolerated, it is suggested, because they keep the rodent and snake populations under control.

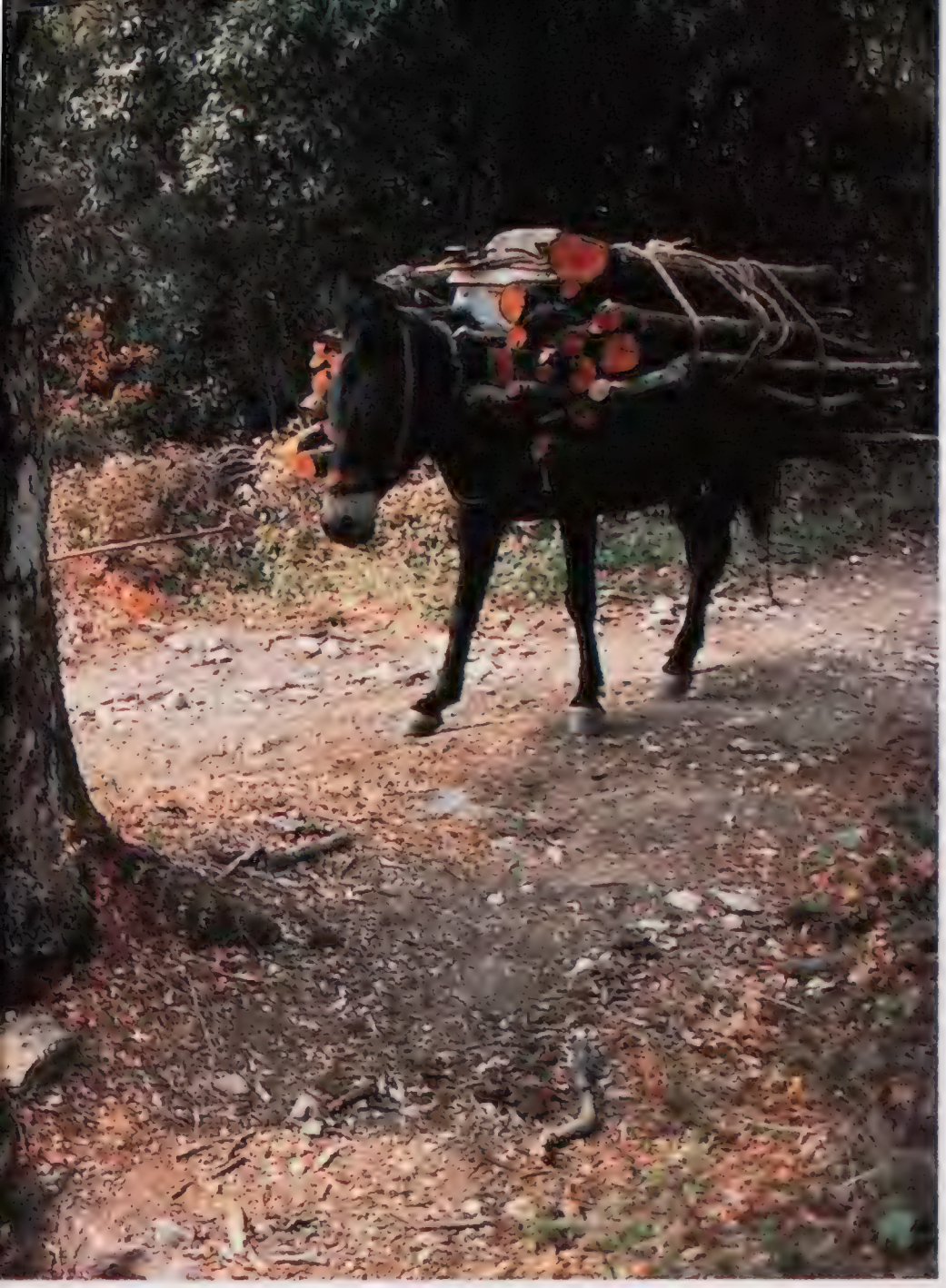
My pilgrimage to the Holy Mountain began with a 2½-hour bus ride through the mountains from Thessaloniki to Ouranoupolis. Looking out on the broad plains below, I could visualize Alexander the Great and his mighty army marching eastward on the first leg of their 11-year quest to conquer the world.

The evening before my departure I spent time with Theodore Korres, a professor of Byzantine history at the Aristoteleian University in Thessaloniki, and a frequent pilgrim to the Holy Mountain over the past 30 years. His advice was straightforward and practical. "Sit on the left side of the boat going and on the right side coming back."

Most of the passengers on the ferry from Ouranoupolis to Daphne were Greek, some of them obviously fathers and sons traveling together. Many had cameras slung around their necks, and a surprisingly large number had mobile telephones tucked in their jacket pockets, an incongruous lifeline to the world they were leaving behind.

Built to carry supply vehicles as well as people, the sturdy vessel hugged the craggy shore going about eight knots. Before long, a succession of buildings began to appear off the port bow, some with formidable walls and medieval towers erected centuries ago to ward off raids by Saracens, crusaders and Catalans. Our vessel passed the monasteries of Docheiariou, Xenophontos and Saint Panteleimon, each an imposing bastion built near the shore, and each a striking sight to behold.

Distinctive for its green, onion-shaped domes, the Saint



Panteleimon Monastery at one time provided refuge to more than 1,000 monks; now there are some 30 full-time residents. The only Russian Orthodox monastery on Mount Athos, Saint Panteleimon boasts a library of more than 20,000 printed books and 1,920 manuscripts. During the heyday of the Soviet Union, the library provided one of the best resources for primary research. Similar pertinent and timely resources can be found in the libraries at Zographou, the Bulgarian monastery, and Chelandari, the Serbian enclave. The magnificent collections at Iviron, a monastery founded by a Georgian in the tenth century and now Greek, include more than a hundred important parchment volumes in the Georgian language.

Once the ferry docked at Daphne, it was soon apparent that Mount Athos is a place where the calendar and the clock are, as Shakespeare put it, "out of joint." Dates are measured by the Julian calendar, 13 days behind the rest of the world. Days are divided into segments, apportioned equally for prayer, work and sleep.

All the monasteries are cenobitic, meaning that each monk is part of a community of men who live, eat and work together, and accept the absolute authority of an abbot. Bishop Kallistos of Diokleia, formerly a lecturer at Oxford University where he was known as Timothy Ware, believes that the more severe way of life has actually contributed to the dramatic renewal of interest in monasticism over the past 30 years. "Young Orthodox today who turn to the Holy Mountain," he wrote, "are looking for the monastic life in its full integrity."

Prior to the 20th century, some estimate, 20,000 monks lived on the Holy Mountain during its most historically active period. By 1903 those numbers had declined to 7,432; and by 1959 the resident population had fallen to 1,641. As the Holy Mountain approached the end of its first millennium, in 1963, few were optimistic about the future. "Huge monastic complexes that once pulsated with life now stood derelict and deserted," Georgios I. Mantzaridis, a professor of theology, wrote in 1973. "Everything betokened decline and decay." Even more ominous, he added, were rumors that the millennial celebrations would be the requiem for Athonite monasticism.

By 1971, the nadir was reached; the census recorded a total of only 1,145 monks living on Mount Athos. The following year, there were 1,146—an increase of one—and for reasons that still are not fully understood, a steady resurgence has continued. By 1996, the brotherhoods had 1,036 more men. The new residents are not only younger—the average age is now under 40—but better educated than ever before. Between 1960 and 1964 only three newcomers had attended college; since then 27 percent of the new arrivals have had university degrees.

The abbots are elected by their brotherhoods, and serve

The treasures of Mount Athos include (clockwise from top): 19th-century fresco of the Holy Trinity at Vatopedi; cast-iron door at St. Paul; iron-cross door crown in Karyes; brass doors at Prodromou depicting Mary and the Holy Trinity, left, and John baptizing Jesus, right. Opposite: A basin for holy water at Dionysiou.

for life. Tasks are assigned to monks each year on January 1; there are cooks, gatekeepers, librarians, farmers, housekeepers and beekeepers. "Everyone works," one monk told me, "but first we must pray."

The 30-minute bus ride from the port of Daphne to Karyes marked the only time that I traveled on a surfaced road. From then on I took footpaths through the heavily forested hills, or rutted logging roads just wide enough for one vehicle to navigate around hairpin turns high above the sea. Distances are computed in kilometers, but most are actually measured by the time it takes to walk from one monastery to another.

"You are about to enter a medieval village," Father Iakovos, a gray-bearded monk at Iviron told me one morning as I was setting off to visit Great Lavra, the oldest and largest monastery of them all. "The Holy Mountain," he said, "stands beyond time." To a great extent, Father Iakovos was absolutely correct: Mount Athos is a place that defies time as most people know it. But there are indications that concessions are being made to the late 20th century. Today, Land Rovers and Mercedes SUVs have replaced most of the mules. Construction equipment and scaffolding are everywhere, indicating that long-delayed restoration has begun at sites in desperate need of repair. There is now electricity and running water available in most of the monasteries. Monks assigned to office duties have telephones, personal computers and fax machines at their disposal; Internet access and e-mail are coming soon.

"You are about to enter a medieval village," Father Iakovos told me as I left for Lavra, the oldest and largest monastery of all.

To generate income, the monasteries allow loggers to harvest trees on parts of their land in cycles that provide for carefully managed regrowth. Outside labor is plainly in evidence; about a thousand men, many of them from Albania and other former Eastern Bloc countries, have been hired to ease the massive workload, principally in the fields and vineyards.

My personal interest in books and manuscript collections led me to focus my visit on those monasteries with the strongest libraries. I was granted access to two of the most extensive collections: those of Vatopedi and Iviron.

I had hoped to begin my stay at Vatopedi but was unable to arrange transportation the afternoon I arrived, having failed to heed Korres' second admonition, to make sure I caught the first bus from Daphne to Karyes. It turned out that the first bus was the only bus available, and I lost close to two hours waiting for the wheezing vehicle to return and fetch the stragglers. By then it was too late to get to Vatopedi before dark.

There are no lights along the trails, of course, and the gates to the monasteries are barred shut at sunset. With night falling—and nobody willing to drive me across the forbidding roads to Vatopedi—I headed down a hillside for Koutloumousiou, about a 20-minute walk away. Founded in the 12th or 13th century, the monastery had once been favored by kings and emperors, but it was also a frequent target of Catalan pirates. In 1497 and again in 1767, fires destroyed the buildings. As a result, the architecture is post-Byzantine, and I particularly wanted to see the structures.

By the time I arrived, dinner had long since been served, and the monks and pilgrims were getting ready to retire. Father Denis, about 25 years old, welcomed me, however, and took me to the refectory for a bowl of lentil soup and bread. Later he showed me to my room. There was hot water and a shower available for my use. The following morning I sought out the young monk and thanked him for his gracious hospitality, pressing a modest donation for the monastery into his hand.

As I walked away from the monastery up the hill toward Karyes, I heard someone calling, "Mister! Mister! Wait, please!" Running toward me up the path at an admirable clip was Father Denis, black cloak flying, one hand holding on to his distinctive headgear. After catching up he handed me a lovely monograph entitled "Nature and Natural Environment in Mount Athos." From it, I learned that there are 37 species of flora and fauna endemic to the Holy Mountain, that 131 species of birds reproduce there, and that preservation efforts protect many plants because they are found nowhere else due to their geographic isolation.

When I arrived in Karyes, the cobblestone road that runs through the center of town was quiet. There were still a few hours before the frenetic activity surrounding the daily arrival and departure of pilgrims. Soon another man walked into the square, and I introduced myself. He told me his name was Costas and explained that he was a librarian from Volos. He was looking for a ride to Simonopetra, a 13th-century edifice built on a vertical cliff a thousand feet above the sea, and one of the few monas-

I received the traditional offering to pilgrims—a glass of cold water, a sweet and a shot of the potent drink raki.

teries he had not visited during earlier trips to Mount Athos. "I come here for spiritual reasons, maybe two or three times a year," he told me. "I get answers to the questions I have about life, about my personal problems, and I get to see the famous icons."

Eager to get to Vatopedi, I retained the services of a monk named Makarios to drive me. My first view of the monastery was of a triangular cluster of fortified buildings set on a gentle slope just above a sweeping inlet to the sea. Vatopedi is an enormous complex that once was home to 800 monks. Today, 80 men live there, most of them youthful members of a new brotherhood that moved over from a hermitage in 1990 bringing vigor and enthusiasm. Father Makarios dropped me off at about 10:30 on a Sunday morning. I was greeted by Father Isidore, a 38-year-old

Distances are computed in kilometers, but most are actually measured by the length of time it takes to walk from one monastery to another on well-worn footpaths.

Cypriot who studied in the United States at the University of New Orleans in the early 1980s. His English is impeccable, and he is a librarian at the monastery.

"This is the aristocrat of monasteries," he told me proudly. His observation has been borne out by historians who have documented the support of royal patrons over the years, and validated just a few months earlier when Prince Charles of England—an honorary member of the Friends of Mount Athos—made his second trip in four years to the Holy Mountain and stayed at Vatopedi.

That evening, Father Isidore took me to the Tower of Our Lady, constructed in the 16th century as a bulwark against pirate attacks. Since 1867, however, it has served as the repository of rare books and manuscripts. The Vatopedi collection of 2,050 manuscripts, some brilliantly illuminated on parchment with gold and lapis lazuli, is considered one of the most significant on the Holy Mountain.

We began looking at maps and archives. Then I examined the books, many of them dating from the earliest years of printing. I spent a memorable hour with indescribably beautiful manuscripts. "By preserving the knowledge, and especially the faith, we keep our identity," Father Isidore reminded me. "We know who we are."

The following morning I attended services and admired the delicately wrought chandeliers and chalices, the paintings, and especially two 11th-century mural mosaics depicting the Archangel Gabriel and the Blessed Virgin, in the narthex. Throughout the church, every exposed wall surface—the vaulted arches, the ceiling—was covered with portraits of exalted saints and narrative paintings depicting scenes from the life of Christ.

Later, I left Vatopedi and took a small launch that stopped along the northern coast at several of the other monasteries. I saw Pantokrator, established in the 14th century with a generous endowment from the Byzantine emperor John V Paleologos, and then we passed Stavronikita, founded prior to 1012.

We docked at Iviron late in the morning, and everything seemed quiet and peaceful. After receiving the traditional offering to pilgrims—a glass of cold water, a cube of sweet confection and a shot of the potent drink *raki*—I took a walk around the monastery. I wandered briefly into the vegetable garden, and then headed up the well-worn trail that leads to Karyes. When I paused and looked back, Mount Athos rose to the southeast, set against a pristine blue sky with the Iviron Monastery below and the Aegean Sea spread out on the horizon beyond. The only sounds were birds chirping and a stream gurgling nearby. The scene was glorious.

Now I could better understand why for centuries, in myth and legend, Mount Athos has provided inspiration

The tenth-century Xeropotamou Monastery is viewed from a kiosk where monks often relax and converse.

for its inhabitants and for those who travel there. Mount Athos gets its name from a mythological giant who is said to have thrown a mass of stone at the god Poseidon during a cosmic brawl, creating the imposing landmark that we see today. In the *Iliad*, Homer follows the goddess Hera as she passes over Mount Athos on a trip from Mount Olympus to Mount Ida, and in his play *Agamemnon*, Aeschylus informs us that the site was sacred to Zeus.

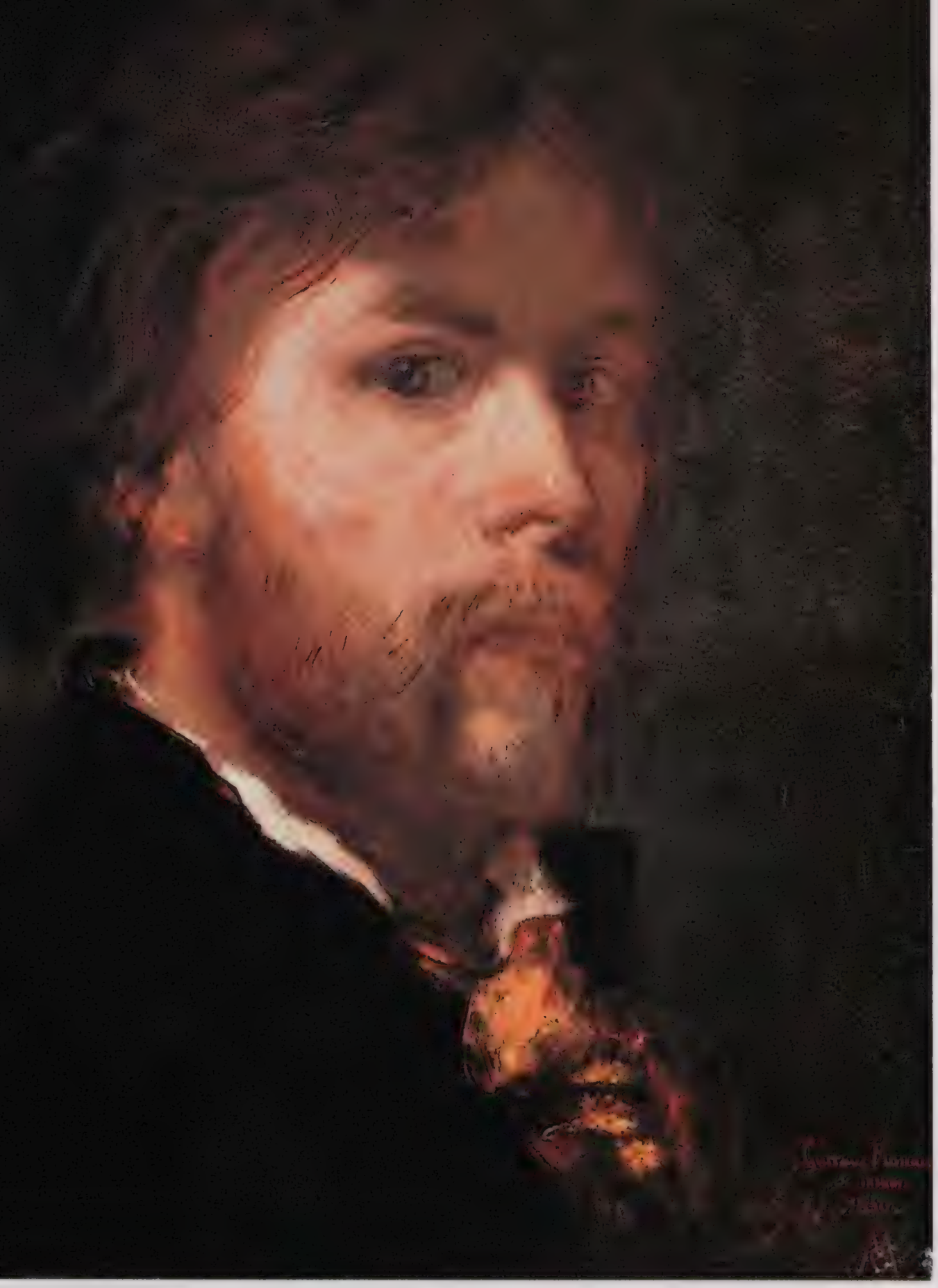
In 492 B.C., a Persian fleet attempting to make the perilous passage around Mount Athos was destroyed by a storm, prompting King Xerxes to build a canal across the promontory at its narrowest point, in 481 B.C. Some 150 years later, the ambitious architect Dinocrates proposed carving the mountain into a monumental statue of Alexander the Great holding a new city in the left hand and a huge bowl to collect water in the right. Alexander declined the bold offer, choosing instead to have Dinocrates accompany him to Egypt and design a Greek outpost on the Mediterranean Sea—the metropolis known today as Alexandria.

One of the reasons Alexander gave for deciding against a settlement at Mount Athos was its difficult terrain. "I think that if someone were to set up a colony there," the Roman architectural historian Vitruvius reports the young king as saying, "their judgment might be held at fault." His words proved prescient; settlements built during pagan times were abandoned. No substantial, enduring construction occurred until 963, when onetime schoolteacher, later to be a saint, Athanasius chose a rocky outcrop at the base of the mountain to establish the Great Lavra Monastery, partly because of its inaccessibility.

During that hike up the hill above Iviron, and again on my last day when I spent the final hours of my journey strolling about the Great Lavra Monastery at the foot of Mount Athos itself, I had a profound sense of what it means to be a pilgrim in a sacred place. But a pilgrim, in the end, is merely a transient, a person passing through. I left on the ferry from Daphne, reflecting about the men who spend their lives on the Holy Mountain.

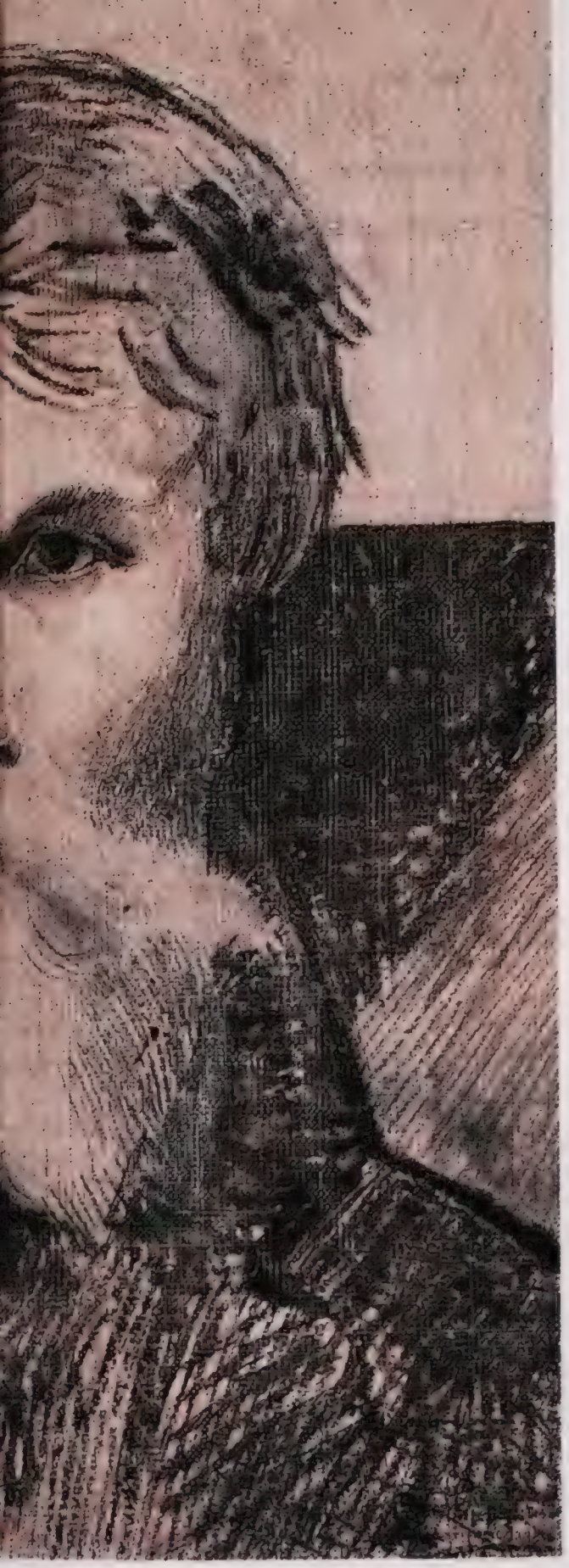
When I returned to Thessaloniki, I asked Korres if he had any thoughts on the subject. "No matter how beautiful the place may be," he said, "you would go mad up there if you did not have a very deep faith. Their spirituality just overwhelms me." I have to agree.

Nicholas Basbanes is writing a companion volume to A Gentle Madness: Bibliophiles, Bibliomanes and the Eternal Passion for Books *(Henry Holt, 1995). Gerhard Trumler lives in Vienna; his photographs have appeared in more than 100 books.*



GUSTAVE MOREAU

The Many Faces of



THE 19TH-CENTURY FRENCH PAINTER INFUSED HIS DIVERSE WORKS WITH EXOTICISM AND POETIC IMAGINATION

BY BENNETT SCHIFF

AT THE ART INSTITUTE OF CHICAGO LAST FEBRUARY, TWO women were looking at the striking exhibition of the work of Gustave Moreau, an artist long out of fashion and little known in this country. A brief dialogue followed:

"Wow!" said one from across the gallery.

"Wait just a minute! Would you just look at this one," said the other, transfixed.

It was, although in slightly varied terms, a reaction identical to that of visitors at the Grand Palais in Paris, where the show began, and at New York's Metropolitan Museum of Art, where it is now on view through August 22.

The international press, with few exceptions, was in agreement. *Paris Match*, the popular weekly magazine, gave the show eight pages. England's highly intellectual and highly regarded fine arts magazine *Burlington* gave Moreau an academic rave. London's *Financial Times* applauded. The Italian and German press joined in. Even *Paris Vogue*, which presides with magisterial prerogative

Moreau's numerous self-portraits include, from left: an 1850 oil in Romantic, Rembrandtesque style; a pen-and-ink drawing, c. 1872; and a rare sketch of the artist at work (detail), c. 1880.

over what is of importance in fashion's imperial city, ran a special layout using models in costumes inspired by the paintings—a concept that would have shocked the quiet and proper painter.

What they saw was an impressively mounted, varied exhibition of the dreamworld fantasies of a correct and elegant little man who lived precisely in one way and painted distinctly in another. It is difficult to decide which, to Moreau, was more real—or, in fact, of more importance. "All that I have sought," he wrote, "I have found, in small proportions no doubt, but in forms perfectly pure and flawless, for I have never looked for dream in reality or reality in dream. I have allowed my imagination free play, and I have not been led astray by it." Driven by his voluntary illusions, Moreau painted elaborate spectacles in hallucinatory colors—a world inhabited by figures and settings taken from the Bible, and from Greek, Roman, Egyptian and Oriental mythology.

At first view the sheer theatricality of his painting comes as an eye-opener—an operatic curtain-raiser, an opulent extravaganza. But after the initial impression, the extraordinary quality of so much of the work follows and you realize that you are, like it or not—and it is just as easy to be put off by it as it is to be entranced—in the presence of a unique, visionary master. A prodigious technician with an active and often fervid imagination, Moreau produced thousands of works—paintings, drawings, watercolors—during his 50-year career, roughly from the mid-19th century to its end. His watercolors are a revelation and may well turn out to be his major accomplishment. In any event, he excelled in that discipline and was one of the finest, most expressive and daring watercolorists in France during the second half of the century.

Reclusive, he nevertheless knew what was going on. When the then-popular Symbolist writer Joris-Karl Huysmans, who was greatly influenced by Moreau's paintings, called the artist "a hermit locked up in the heart of Paris," the acerbic painter Edgar Degas, who knew Moreau well, replied, yes, "a hermit who knows what time the trains leave."

He was greatly admired by Proust, who frequently wrote about him. Later, his strange and dramatic work caught the attention of André Breton, plumber and propagandist of dreams, the high-priest theoretician of Surrealism, which would become an important movement in 20th-century art.

Living quietly and comfortably on a private income, Moreau was able to indulge his taste for a solitary life, painting obsessively and selling selectively at high prices to collectors who both commissioned and eagerly applied for works that might become available. And then, slowly, as the new century turned over, just two years after his death in 1898, he slipped out of sight and descended into the darkness that is the fate of visual artists whose work people no longer look at.

HE WAS GREATLY ADMIRED BY PROUST. LATER, HIS STRANGE AND DRAMATIC WORK CAUGHT THE ATTENTION OF ANDRÉ BRETON, HIGH-PRIEST THEORETICIAN OF SURREALISM.

It was an odd situation considering that Moreau had, in effect, built himself a memorial right there in Paris, where he was born and lived his entire life. Devoted solely to his work, the Musée Gustave Moreau opened to the public in 1903, his bequest to France, but few people came.

About 25 years ago you could make a pilgrimage to the museum, a trip quickly accomplished in about ten minutes on the Métro from the center of the city. Once there, you could walk through the extraordinary rooms of the Beaux-Arts-style mansion, surrounded by the artist's exotic and visionary images, and be transported to another realm. And, at least for one visitor on that day, you would be the only person there.

Ten years ago the American writer Edmund White went there and found the place to be "a refuge, a closed temple, even a hiding place." He relates the story of an expatriate American writer who just after World War II went to see the museum, only to find a guard there who denied him access. Bribing his way in, he was startled to find that the entire museum had been turned into a chicken coop, a black-market poultry yard. It was a situation that would have delighted the Surrealists. It would, how-

Shown at the 1864 Salon, *Oedipus and the Sphinx* (above) established Moreau's reputation and prompted a rethinking of history painting. His jewel-like *Salome* (left) caused a sensation at the 1876 Salon.

METROPOLITAN MUSEUM OF ART, NEW YORK; PP. 100-101 MUSÉE GUSTAVE MOREAU, PARIS (3); UCLA AT THE ARMAND HAMMER MUSEUM OF ART AND CULTURAL CENTER, ARMAND HAMMER COLLECTION, LOS ANGELES

ever, have devastated Moreau, though the scene could not have been more bizarre than some of those depicted in his own paintings.

The Art Institute of Chicago's Larry J. Feinberg was one of the curators of the current exhibition. Titled "Gustave Moreau: Between Epic and Dream," the retrospective brings together more than 180 paintings, watercolors and drawings, and marks the centennial of the artist's death. Feinberg, who spent two years digging in the Moreau Museum's storage rooms and closets researching the show, recalled recently that there "one feels transported back in time to his world. The rarefied air is so intoxicating, it's barely breathable."

HERCULES STANDS UNPERTURBED AS HE IS ABOUT TO END THE AWFUL CAREER OF THE SEVEN-HEADED HYDRA—THE SERPENTINE MONSTER THAT HAD HELD ARGOS TERRORIZED, AND WHICH READIES ITSELF TO STRIKE ONCE MORE.

The museum is still turning up spectacular surprises. Just a few years ago its director, Geneviève Lacambre, found an unfinished version of *Diomedes Devoured by His Horses* rolled up in the corner of a hidden cupboard, overlooked since the museum opened some 90 years before. The unfinished work, done ten years after the original, is impressive. Sweepingly free, its tones pale in the underpainting—with bare patches of canvas here and there—the masterwork surpasses the original painting. Both are included in the show, which is the largest and most completely researched Moreau exhibition ever mounted.

Gustave Moreau was born in Paris in April 1826 and died there, almost to the day, 72 years later. His father, Louis, a successful architect, was in charge of the construction of the Place de la Concorde in the heart of Paris and of a number of central buildings, including those for several international industrial expositions. His mother, Pauline Desmoutier, daughter of a chateau owner and former mayor of Douai, also came from comfortable, upper-middle-class circumstances.

There was a younger sister, Camille. The family was close, loving and supportive of one another. Gustave was sent to a carefully selected boarding school at the age of 11 but left when Camille died three years later. Even more protective now, the parents educated Gustave at home, where there was a rich and extensive library that the young student devoured. There he encountered the classic volumes on mythology, Ovid's *Metamorphoses* and the like, which became the basis of so much of his major work. He also studied Roman architecture, the Middle Ages, the Renaissance, the designs and decorations of the Middle and Far East, Shakespeare and, devotedly, the Bible, both the Old and New Testaments. He was to keep the library, adding to it steadily, until he died.

His interest in art as a profession was never in doubt. His parents supported him warmly, with high expectations for his talent. Around 1844, he entered the studio of the neoclassical painter François-Edouard Picot on the rue de La Rochefoucauld. Some years later Louis Moreau would buy a house on the same street, number 14, which would then become the family home, Moreau's studio and ultimately the Musée Gustave Moreau. With Picot, a follower of Jean-Auguste-Dominique Ingres, Moreau prepared for the rigorous entrance exams for the state-supported Ecole des Beaux-Arts. If one had any expectations of making a living as an artist in the France of that day, it was considered mandatory to gain admittance to that august institution.

Moreau made it on his first try (it took Matisse, eventually his devoted pupil, at least two) and was admitted in October 1846. Students of distinct promise were expected to compete annually for the prestigious Prix de Rome, awarded by the Académie des Beaux-Arts, which ran the school, administered the annual Salon and was considered, in its heyday, the Supreme Court of Art. The award guaranteed a fine future and carried with it a residency at the magnificent Villa Medici, France's cultural outpost in

MUSÉE GUSTAVE MOREAU, PARIS (2); P.105 ART INSTITUTE OF CHICAGO

Rome. Moreau entered two Prix de Rome competitions and twice failed to win. He then left the Beaux-Arts and struck out on his own, a path made smoother by his father, whose connections led to several commissions.

As a struggling artist striving for recognition, Moreau entered the seasonal salons, gaining acceptance at some, failing at others. The government commissioned one entry and placed it in a museum in Dijon. Another entry was sent to a museum in the town of Bourg-en-Bresse in a region known to this day for the quality of its chickens.

In the early 1850s Moreau came into contact with the Romantic painters Eugène Delacroix and Théodore Chassériau, who influenced both his style of painting and his style of life. From these two masters, Moreau derived his penchant for exotic romanticism, dramatic lighting and brilliant colors. Taking a studio near Chassériau's, Moreau developed an interest in up-to-the-minute fashion, became something of a dandy, and frequented the literary and artistic salons of the time.

Possibly Moreau's most carefully conceived painting, *Hercules and the Lernaean Hydra* (1869-76) made its debut at the 1876 Salon. The artist made a number of studies for the epic canvas, including the black chalk sketch of Hercules and the watercolor of snakes opposite.

Chassériau's untimely death in 1856, at the age of 37, devastated Moreau, who retired to his studio to brood and work. Not satisfied with what he was doing, he decided to go to Italy for an extended period of study, delving deeply into the methods and work of masters of the Renaissance and the architectural remains and artifacts of Greek and Roman antiquity. He was to travel throughout the country, and its art and atmosphere were to have a profound and lasting effect on his work. The trip also exposed him to the influence of Byzantine enamels, early mosaics, and Persian and Indian miniatures, all of which would play a significant role in the evolution of his individual style and in the jewel-like effect of his technique. At the Villa Medici in Rome, Moreau met Edgar Degas and traveled around the country with him for a while. They became fast friends, but over time, as their styles diverged, the friendship cooled.

Soon after his arrival in Italy, Moreau wrote to his parents from Rome: "There is a great noise within me, a great movement of ideas and sentiments. . . . I'm putting everything aside for when I'll have need of it." The experience transformed him. It was as if the young artist had built a permanent library of visual memories on which he could always draw.

His copies of the masters—Leonardo, Michelangelo, Raphael, So-

doma—painted during this period, were marvels of exactness. A sampling of them is included in the exhibition. "What was unusual," writes Feinberg in his illuminating essay on Moreau and the Italian Renaissance, in the show's excellent catalogue, "was Moreau's approach to the art of Leonardo and Michelangelo." He "eschewed the heroic and the narrative in favor of a depiction of the mysterious and the private experience of the individual. He looked not to Leonardo's *Last Supper* but to his enigmatic *Saint John* . . . he preferred Michelangelo's Sistine prophets and sibyls, each involved in personal meditation or ecstatic revelation, to the chapel's grand, dramatic scenes."

Moreau was especially absorbed by the "sleeping" figures in the Sistine Chapel and by the idea of an "otherworldly sphere to which they seem to belong. For everything in them is a mystery to us," he wrote. "We do not walk, we do not act, we do not rest, we do not ponder, we do not weep, we do not think in that way on this planet, in this our world." He once described himself as an "*assembleur de rêves*," an assembler of dreams. This idea, which lay so deeply embedded in much of Moreau's subsequent work, explains a great deal about the many detached and enigmatic figures who appear placid and virtually expressionless in the face of the most intense and threatening situations.

Outstanding examples of psychological and physical detachment can be seen in one after another of Moreau's paintings. In *Oedipus and the Sphinx* (1864), for instance, the winged creature—half nude female, half lion, an incubus clawed into Oedipus' breast—does not seem to inflict pain at all. Instead, the grotesque creature and its placid victim appear to be dreamily engrossed in each other, although Oedipus is soon to answer the Sphinx's riddle and she, or it, is to fall dead to the ground, finally, having already shredded any number of hapless voyagers unable to answer the riddle. Their bits and pieces are, in Moreau's superbly rendered canvas, strewn about the foreground.

And so, Hercules, in *Hercules and the Lernaean Hydra*, stands unperturbed as he is about to end the awful career of the seven-headed Hydra—the serpentine monster that had held Argos terrorized—which readies itself to strike once more as it is about to be dispatched by the hero.

Even the glowingly beautiful Salome dances as if in a reverie before a hazy Herod seated on his throne, as though the bloody deed of separating John the Baptist from his head hadn't occurred to her, although that is precisely what her dance is all about. Salome appears here as still and straight as a motionless spindle balanced *en pointe*. A work of sheer wonder, the painting burns and glows in muted oranges, sulfurous saffrons and turquoise blues, in the midst of which Salome stands, an enameled figure, a

Painted c. 1895, Moreau's watercolor *Landscape Study* exhibits the bold, expressive color and abstract quality of his late works.

balanced dagger. Moreau painted her, he said, as if she were a jeweled reliquary. And what, if not dreamy, is the lyrical nude in the beguiling late painting *The Unicorns* (page 109), a delicate, fairy-tale picture.

Upon his return to Paris in 1859, Moreau went to work in his studio but, for a number of years, did not show his art to the public. With the exhibition of *Oedipus and the Sphinx* in the Salon of 1864, and *Orpheus* in the Salon of 1866, however, Moreau achieved formal recognition of his prodigious talent. With these two paintings, the artist helped reinvigorate the tradition of history painting, infusing his epic tales with poetic imagination, exoticism and a sense of the bizarre.

In 1859 Moreau had met Alexandrine Dureux, his "best and only *amie*." They never lived together. Instead he paid the rent for a flat for her in a nearby apartment building. When his mother died, he wrote to Alexandrine: "I want nothing more for my last hours than [your] hand in mine, and that we be left alone." But he didn't invite her to share

MUSÉE GUSTAVE MOREAU, PARIS

The Desert That Glistened With Water.

Southeastern New Mexico is home to mesquite and chaparral, mesas and horizons that shimmer with heat. For animals of this parched land, survival comes with water. So people who work nearby helped design and build a system of dozens of unique watering units that gather, store and distribute water to bobcats, antelopes, hawks and more. Quenching nature's thirst and giving it a chance to survive.

Chevron

People Do.

www.peopledo.com

©1999 Chevron Corporation

the spacious family mansion, and perhaps she didn't want to. Yet he did not want ever to be far from her. The couple was devoted for 31 years, until she died in 1890, at the age of 54. Distraught, and more than ever alone with his work, Moreau painted two memorial paintings—*The Parca and the Angel of Death* (right) and *Orpheus at the Tomb of Eurydice*. "After the death of a cherished being," he wrote, "one must isolate oneself to remain faithful to her."

Following Alexandrine's death, Moreau's style changed. His brushwork became looser and more expressive; his pigment grew thicker, more impastoed; and his forms became increasingly abstract. The overriding effect of these later paintings was to evoke an emotional response through the use of color, line and form. Some even view his later nonfigurative works as heralds of Abstract Expressionism. Certainly his art inspired a generation of Symbolist painters, poets and writers and had a marked impact on other artists, including the Surrealists and the radical group known as the Fauves.

In the last six years of his life, Moreau continued to work obsessively. Emerging from his seclusion, he honored his artist friend Elie Delaunay's deathbed request and accepted an offer to teach at the Ecole des Beaux-Arts. He quickly became the mentor, if not to say idol, of his students, to whom he imparted, through impassioned lectures before masterpieces in the Louvre and thoughtful critiques of their work, a sense of freedom from the otherwise rigid controls of the school. He taught, among a number of others who became known afterward, Georges Rouault and Henri Matisse—both of whom never ceased to praise him for setting them free.

Rouault, greatly influenced by Moreau's style, went on to become the first curator of the Moreau Museum. Matisse, who studied with Moreau for six years and whose style was quite different from that of his mentor, spoke with reverence and affection of Moreau and what he had meant to him. "He didn't set his pupils on the right road," Matisse said. "He took them off it. He made them uneasy. . . . He didn't show us how to paint; he roused our imagination in front of the life he found in those paintings."

In March 1896, having encouraged Matisse to enter a competition, Moreau came to the artist's studio on the Quai Saint-Michel to see what his pupil was doing. "Already frail, crippled with shooting pains in his limbs and walking with difficulty," Hilary Spurling relates in her fine and indispensable recent biography of Matisse, "Moreau had to be helped up more than a hundred steep steps to the fifth floor." Matisse never forgot the intimacy of the visit, Spurling tells us. "Nearly half a century later Matisse could not speak of it without tears in his eyes."

It was at this time that Moreau went about building his museum. In 1895 he undertook extensive renovations, adding two exhibition halls to the top of the building. It was the realization of an idea he had noted on the bottom of a sketch in 1862, the year in which his father died: "I think of my death and of the fate of all these works and compositions I have taken such trouble to collect. Separately they will perish, but taken as a whole they give an idea of what kind of an artist I was and in what kind of surroundings I chose to live my dreams."

In his will, he said it was his "dearest wish that it [France] keep this collection always or for as long as is possible and maintain the wholeness of its character as a definition of the sum of the work and effort of the artist during his life." The collection he left behind came to more than 14,000 works—paintings, watercolors, drawings and numerous sketches—as well as a vast archive of documentary and supportive material and personal effects.

As it happened, as fashion twisted and twirled, he had painted himself into a cul-de-sac, but as it has turned out, one from which a phosphorescent, reactivated volcano is sending out waves of intensely colored light and dreams.

For now, the people are coming.

THE OVERRIDING EFFECT OF MOREAU'S LATER PAINTINGS WAS TO EVOKE AN EMOTIONAL RESPONSE THROUGH THE USE OF COLOR, LINE AND FORM.

In researching this article, contributing editor Bennett Schiff revisited Paris' Moreau Museum after 25 years and found it filled with visitors.

The idyllic, meticulous rendering of *The Unicorns* (right), c. 1887, provides a poignant contrast to the rapid, scratchy brushwork and somber expression of *The Parca and the Angel of Death* (above).

"There is a certain amount

Norman Rockwell

of humor in checkers"

But if you think this game is easy,
you haven't met the Ayrshire Lassie,
the Black Doctor, the Goose Walk
or the Canalejas Cannonball

BY TIM HENSLEY

THE BRIGHT AUGUST SUN POURS INTO THE BANQUET HALL OF the Ramada Limited on Broadway in Hattiesburg, Mississippi. And everywhere shines the glint of balding heads. At rows of covered tables, players assume their competitive postures—some hunched, some straddled, some with their heads propped in their hands—all pondering deeply the tournament-standard squares of green and buff spread before them. Notepads, drink cups and time clocks litter the tables. One player expectorates noiselessly into a shiny red cup, a pouch of chewing tobacco at the ready. The hushed atmosphere of the hall is interrupted only by ripples of banter. On the far wall stretches a computer-generated banner: "Welcome Checker Players and Friends."

And it is not hard to feel welcome. On this first day of the national tournament, spirits run high, and all around checker players and their spouses are renewing old acquaintances. Among the group are my grand-

SLEEP BETTER ON AIR!

90-Night In-Home Trial
With Money Back Guarantee!

- Customize mattress firmness for *each side* with the touch of a button!
- Unique air support cradles your entire body for better sleep comfort!
- Reduces uncomfortable pressure points!

SELECT COMFORT
The Air Bed Company
Select Comfort Direct Corporation
6105 Trenton Lane N., Minneapolis, MN 55442
© Select Comfort Direct Corp., 1999

FREE Video and Catalog!
1-800-831-1211
Ext. 26154

Recorded Books™

"Best on Audiocassette"

The Greatest Generation
by Tom Brokaw

Unabridged on audiocassette. Over 2,500 titles to choose from—histories, mysteries, classics, sci-fi, best-sellers and more. Professionally performed by Broadway actors! Ask about easy rentals by mail. Call now for a free brochure:

1-(800)-638-1304
270 Skipjack Road • Prince Frederick, MD 20678-3410

PERSONALIZED CARTOUCHE JEWELRY
HANDMADE IN EGYPT
Translate Anything into Ancient Egyptian Hieroglyphics
18k Gold and Silver Pendants, Rings and Bracelets
Call us for a free brochure and more information
Discoveries Egyptian Imports
2910 Business Center Dr. dept. SM · Alexandria, Va. 22314
or visit our website at:
"Love" http://www.egyptianimports.com
1-800-237-3358
Celebrating our 18th year!
DISCOVERIES EGYPTIAN IMPORTS

father and grandmother, tournament regulars for nearly 40 years. Once described as the "Gentleman of Checkers," Grandfather has already been talking up the article I have come to do; interviews follow easily. Grandmother, petite and gracious, greets my two sons and me with warm, Baptist hugs. As bona fide "friends" of checkers, we are even treated by motel staffers to free Burger King value meals for lunch. Somehow that makes it easier to ignore the mahogany palmetto bug belly-up on the floor of our room. Checkers may be friendly, but it's not always plush.

Even mighty Greek warriors such as Trojan War heroes Achilles and Ajax (shown on this sixth-century B.C. amphora) did battle on the checkerboard.

Nor is it what most people think: a pastime for old men and children, on a par with tick-tack-toe or Go Fish. Sure, checkers in America is a kind of Norman Rockwell icon, a symbol of good-natured competition and wholesome amusement. And nearly everyone knows how to play. In the American version, each player fields 12 disk-shaped pieces on a checkerboard of 64 light and dark squares; the object: to capture or confine your opponent's pieces; and the procedure, in bare bones: move single pieces along the dark-squared diagonals, capture enemy pieces by jumping over them to an open square, and convert single pieces into double-decker kings by advancing to the last row on the board—the king row. But despite checkers' popularity, and despite the ease with which it is learned, there are few people who understand its actual depth.

Take to moving rooks and knights around a board and everyone thinks you're an intellectual; sit down at the cracker barrel and you're lumped in with all the slackers of the world—"checker players and other loafers," as Jimmy Carter once put it.

It has not always been this way. Games resembling checkers were popular as long ago as 1600 B.C. At Thebes, a wall painting apparently showed Ramses III playing an early form of checkers with a lady. In Rome, the game was known as *ludus latrunculorum*, the "game of little robbers." By the 17th century A.D., the game that we know as checkers had spread over western Europe, becom-

ing a favorite pastime among commoners and aristocrats alike.

But somewhere along the line attitudes began to change; a stigma developed. In 1756, William Payne, a mathematician, wrote the first book on draughts in English. ("Draughts" is the British term for checkers and is pronounced DRAFTS, not DRAWTS.) Two interesting features of the work are its dedication and preface, both said to have been written by the celebrated wit and lexicographer Samuel Johnson: "When I take the Liberty of addressing to Your Lordship a Treatise on the Game of Draughts, I easily foresee that I shall be in Danger of suffering Ridicule. . . . "

That the author wades through a slough of checker misapprehensions does not mean, however, that the game was unpopular among English-speaking people. The passages speak also of the "multitudes" who play. Indeed, the game enjoyed such popularity in Britain that inns put checkerboards on their signage—in the same way that modern motels advertise "Free HBO." Pushed forward by the impetus of English colonialism, the game entered its golden age during the late 1800s when truly it could be said: the sun never sets on a good game of draughts. As the June 1900 issue of *Draughts World* reported, "not only do Scotchmen play the game at home, but when they go abroad they carry their love of the game with them and teach it to the natives of their adopted jungle with the spirit of a true missionary."

Apparently, it is this love of the game, this taste for its pleasures, that has sustained devotees through the years, through countless smirks and knowing looks. Such treatment, over time, would drive most people to pick up the nearest stone. Checker players are happy just to play the game.

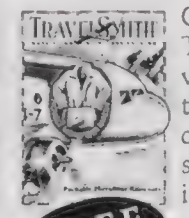
Consider Marion Tinsley, who reputedly once commented that the typical response on being introduced as a checker player is: "My little boy plays checkers, you must play with him." And just who was Marion Tinsley? Only the best checker player in the recent history of the game. Tinsley held the world title from 1955 to 1958 (retired) and then again from 1975 to 1992, a remarkable feat. Still, for most people, he is only an entry in the *Guinness Book of World Records*, rating right up there with the guy who ate 13 doughnuts in six minutes. As Tinsley himself once said, "It's like Christianity and the Fellowship of Suffering." Checker players "have a fellowship of suffering . . . people look at the checker board and don't see anything, and they conclude there's nothing to see. It's just natural."

And what is there to see? According to one estimate, some 500 quintillion (5×10^{20}) possible positions. No wonder master players spend years analyzing favorite lines of play, developing "cooks" that will throw a wrench in an opponent's position.

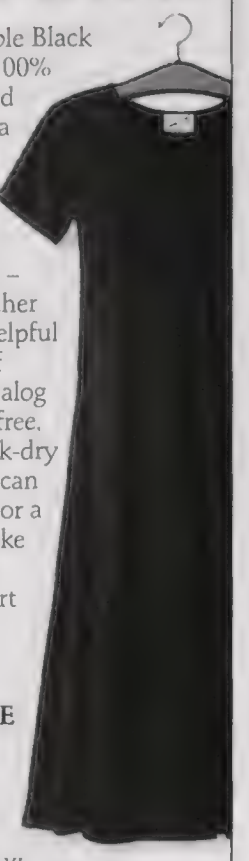
To the chess aficionado (who deals with far more possibilities—on the order of 10^{44}), that may sound like so much "bosh." So said W.J.A. Fuller, chess editor of the old *Leslie's Illustrated Newspaper*. But any number of chess players (including Fuller himself) who cross over into . . . duh . . . checkers, soon discover that pride goeth before a fall. Fuller once played a round of checker games with a Mr. Hodges from Buffalo and was beaten almost at will. He claimed a draw at one point, offering odds and a wager. When Hodges accepted, Fuller gently drew his knees apart and allowed the board and pieces to fall to the floor. The incident gave rise to a derisive term, "Fuller's Draw," the best an inferior player might accomplish in a game with a master.

And then there's the story about Bobby Fischer. According to checker grand master Ed Sheidt, Fischer was in Washington back in 1972 for an exhibition chess match and was challenged to a game of checkers by George Vidlak. Vidlak offered to play

The Indispensable Black Travel Dress™



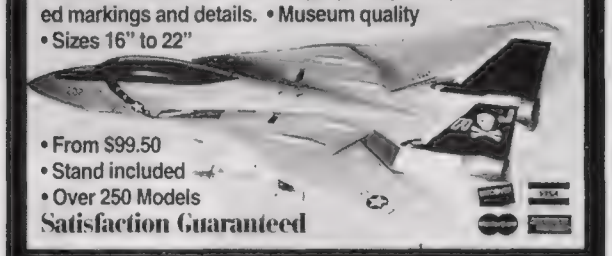
Our Indispensable Black Travel Dress is 100% wrinkleproof and tucks snugly in a corner of your suitcase. Dress it up with pearls or dress it down with flats – it looks great either way. It's just one of over 350 helpful products in our new catalog of uncommon travel gear. The catalog is filled with versatile, wrinkle-free, lightweight, easy-to-pack, quick-dry travel clothes, many of which can double for daytime sightseeing or a night on the town. We also make exceptional luggage, totes, and tools to assure the most comfort and least hassle while away from home. Call now for your **FREE CATALOG** and **FREE OUTFITTING GUIDE** with suggested packing lists and good, solid advice for the trip you're planning!



Indispensable Black Travel Dress™
Now available in *Black* and *Midnight*. XS–XL
Regular and Petite #5183 $99 Plus 8⁻⁻ S&H
Also available in above the knee or long sleeve mock t-neck

TRAVELSMITH®
60 Leveroni Ct • Novato, CA 94949 • www.travelsmith.com
800•950•1600 Dept SMØ1932

PACIFIC AIRCRAFT
THE COLLECTOR'S CHOICE
Makers of Fine Aerosculptures
Hand carved from solid mahogany. Exquisitely hand painted markings and details. • Museum quality
• Sizes 16" to 22"



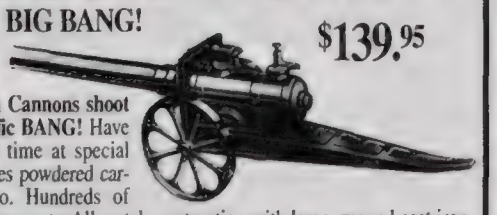
• From $99.50
• Stand included
• Over 250 Models
Satisfaction Guaranteed

Call (800) 950-9944 for Catalog and Orders
14255 N 79th Street, Scottsdale, AZ 85260
Phone (602) 991-1841 • http://www.warplanes.com

NEW ZEALAND
Climb aboard our private, classic Douglas DC-3 aircraft and tour the islands in a most unusual and luxurious fashion. This 10-day tour offers outstanding accommodations, cuisine, wine and a wide variety of "kiwi" activities. See what it's like to travel by private plane on this Great New Zealand Expedition!

From $5,795 from Christchurch, NZ
September 20-29, 1999

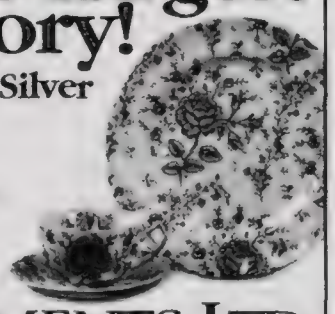
For a free brochure:
TravelWild Expeditions **800-368-0077**
www.travelwild.com SM48

Celebrate July 4th & All Events
CARBIDE CANNON
BIG BANG!
$139.95

Mammoth Cannons shoot with terrific BANG! Have a bang-up time at special events. Uses powdered carbide ammo. Hundreds of shots for few cents. All metal construction with large, rugged cast iron wheels. Machined brass mechanism for easy loading and firing. Authentic turn-of-century design. Handsome decor when not in use. Made in USA to last a lifetime. Available in 3 sizes: 9" cannon, **$59.95 postpaid;** 17" cannon, **$109.95 postpaid;** 25" cannon (shown here) with rapid firing and automatic loading, **$139.95 postpaid.** The larger the cannon the louder the bang! **Carbide ammo, about 100 shots, $7.50; 3-pack $18.00. Spark plugs, 3-pack $2.00.** Send check, money order or call. Visa, MasterCard accepted by mail or phone. Give card number & expiration. Money-back guarantee. Send for **FREE CATALOG!**
The Conestoga Co., Inc., Dept S, PO Box 405, Bethlehem, PA 18016
★★ Call 1-800-987-BANG ★★
www.bigbangcannons.com

VIXEN HILL GAZEBOS
www.VixenHill.com

Discover our wide selection of modular, cedar Gazebos and screened GardenHouses, engineered for easy assembly by the non-carpenter.
Send $4 for our 22-page color catalog with pricelist.
Vixen Hill, Dept. SM-9 , Elverson, PA 19520 • 800-423-2766

CHARMING • ROMANTIC • INTIMATE
ALLURING • DISTINCTIVE • TRADITIONAL
Small Treasures
THE ISLANDS OF THE BAHAMAS
1-877-9-TREASURES
for reservations or a free directory.
www.smalltreasures.bahamas.com
THE ISLANDS OF THE BAHAMAS
It Just Keeps Getting Better®

World's Largest Inventory!
China, Crystal, Silver & Collectibles
• Old & New
• 100,000 Patterns
• 5 Million Pieces
• Buy & Sell
Call for FREE lists.

REPLACEMENTS, LTD.®
PO Box 26029, Greensboro, NC 27420 Dept. SM
1-800-REPLACE (1-800-737-5223)
www.replacements.com

When Louis-Léopold Boilly painted *The Game of Checkers in the Café Lambdin* in the early 19th century, checkers had become one of Europe's most popular pastimes.

him first in a game of chess, reported Sheidt, but when the chess match ended in a draw, Fischer refused to play Vidlak in checkers.

Many players familiar with both games assert that it takes longer to learn to play checkers at the master level than it does chess. Tinsley said playing chess is like looking out over a limitless ocean, whereas playing checkers is like staring into a bottomless well. Either way, the possibilities are endless. And what checkers lacks in breadth, it makes up in precision and finality. "Draughts is a less attractive game, infinitely less," said J. H. Blackburne, the English chess master, "but it is more scientific. You see, a step at draughts is irreparable. At chess, however, you can get back, change the disposition of your men, and possibly win." In checkers, unless a piece is "kinged," it can never move backward. Thus almost every move in checkers advances the game inexorably; there is clash and consequence with every motion. In chess, that advance comes only with the pawns. As checker master Tim Laverty of North Carolina so graciously puts it, in chess "you're just kinda poking around the board."

How much study does it take to become a checker master? In high school I decided to find out. Perhaps I was just returning Grandfather's interest: I played on the high school basketball team, and he was one of my biggest fans. But I think it had more to do with books; for in the language of clinical psychology, I was a budding bibliophile; and Grandfather had a whole library on the game of checkers: old titles, "from the 1800s," as I would say, and every one exuding the fragrance of aging paper and Vitalis. Besides that, I had mastered tick-tack-toe, and had taken algebra, and physical science, so with my head brimming with knowledge, I figured it wouldn't take long to learn Grandfather's hobby.

When I asked if I could borrow one of his books, he was, of course, very obliging. Holding one of the volumes in his calloused, nurseryman's hands, he told me about the modern style of play, three-move checkers, in which the first moves of the game are determined by lot. (Old-style play is

COPYRIGHT ARTS REGISTRY

Grandfather's match against Tinsley for the world title included a game lasting six and a half hours.

called "go-as-you-please," and that is precisely what you do.) He also gave me a copy of the classic, *Lees' Guide to the Game of Draughts or Checkers*, published in 1893. As I recall, he recommended some other texts as well. But *Lees'* was a good overview, and since mastery was my purpose, that's the one I chose.

I remember how I took the book home and, in the privacy of my bedroom, turned excitedly to the first play, the Alma opening, whereupon I was confused to find that the guide was little more than a compilation of numbers with enigmatic annotations like: "16-20 not so good, the text does more than equalize matters" and "If 21-17, then reply 2-7, for W. dare not play 18-15, and must allow the cut by 16-9, which leaves Black with a winning advantage."

The next opening in the guide was the Ayrshire Lassie. Despite her fetching name, the Lassie ran for several pages with six variations supplemented by various items of historical esoterica: "3-8 here loses. The late Mr. Seton trapped Wyllie on it in 1850: 3-8, 7-11, 16-7, 15-19, 24-6, 14-17. B. wins." This was not tick-tack-toe.

Thumbing through the rest of *Lees'*, I saw that the Alma and the Ayrshire Lassie were just the tip of the checker iceberg. After them came the Black Doctor, Bristol, Cross, Defiance—right on through the alphabet to the Will-o'-the-Wisp. My youthful enthusiasm turned brutally frank: "There is no way I'm going to learn all this just to play a game of checkers."

Others have not been so easily turned away. As a 10-year-old Scottish shepherd, James Wyllie, later the world champion, "would sit for hours by himself on the hillside in profound study of the game." Eventually his ability was recognized by his employer, a Mr. Porteous, who took him to the Edinburgh Grass Market (a gathering place for local draughts players) and there introduced him as his "Herd Laddie." That sobriquet would stay with Wyllie the rest of his checkered life—through multiple world titles and exhibition tours in England, America, Australia and New Zealand.

Marion Tinsley studied checkers in every spare moment while earning a degree in mathematics at Ohio State University. "I doubt if anyone has ever worked harder at anything than I have in checkers early in my career," he once remarked. "From 1944 to 1950

TRAVEL TO DESTINATIONS OUT OF THIS WORLD.

Meade ETX 90EC Telescope. Shown with Autostar Computer Controller.

Take a guided tour of the heavens at the push of a button with the Meade ETX-90EC Astro Telescope.

See more in 20 minutes than Galileo saw in a lifetime. Galaxies, nebulae, star clusters, the planets, and more. New Meade digital technology makes finding any object in the sky as easy as pushing a button!

Choose from over 14,000 celestial objects stored in the Autostar™ hand controller's database, press GO TO, and the telescope moves to the object, places it in the field of view, and follows it across the sky — automatically, first time, every time. This is one telescope you have to see — and use — to believe.

Use the telescope's automatic guided tour feature to explore the rings of Saturn, mountain ranges on the Moon, or dust lanes in the Andromeda Galaxy. The Meade ETX-90EC Astro Telescope with Autostar Computer Controller — easy to use by anyone, anywhere, anytime.

MEADE®

RITZ CAMERA
1-800-52-FOCUS

Discovery CHANNEL STORES
1-800-938-0333

Call **1-800-62-MEADE** for a free copy of Meade Telescope Catalog #134 or for a dealer location near you. ETX-90EC: $595, complete with 4-speed electronic hand controller (not shown). #497 Autostar Computer Controller: $149. Meade telescopes and accessories are available at over 2000 dealer locations in the U.S.A. and Canada. **Meade Instruments Corp., 6001 Oak Canyon, Irvine, CA 92620. FAX: (949) 451-1460. www.meade.com** ©1999

Panama - Belize

Exotic, adventurous, smallship cruises

FREE BROCHURE
800-556-7450
www.accl-smallships.com

AMERICAN CANADIAN CARIBBEAN LINE
"The Small Ship Cruise Line"

Also Virgin Islands, St Martin, Antigua, Grenada, Orinoco
U.S. Registry

COUNTRY WALKERS
Join us for our 21st year offering worldwide walking vacations

- *Small groups*
- *Knowledgeable local guides*
- *Fine accommodations & cuisine*

44 unique itineraries throughout Europe, North and South America, Africa and the South Pacific.

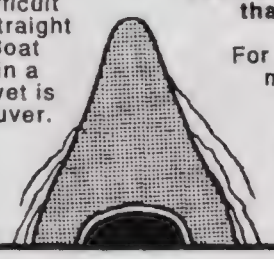
Free catalog 800-638-0291
www.countrywalkers.com

THE POKE BOAT®
IT'S EVERYTHING A CANOE ISN'T.

A canoe is tippy. A Poke Boat isn't. It's remarkably stable.

A canoe is hard to turn and difficult to keep in a straight line. A Poke Boat isn't. It stays in a straight line, yet is easy to maneuver.

A canoe is heavy. A Poke Boat isn't.



It **weighs only 22 pounds** - built with aircraft strength.

You can buy more than a canoe.

For more information, give us a call.

606-986-2336.

POLAR BEARS

The world's greatest gathering of polar bears occurs each autumn in Churchill, Manitoba. Join our naturalist guides on the tundra for an unforgettable journey to see the Great White Bears!

From $1,995 Oct & Nov 2000

TravelWild Expeditions **800-368-0077**
www.travelwild.com SM47

New Authors
Publish Your Work
ALL SUBJECTS CONSIDERED

write, or send your manuscript to:
MINERVA PRESS
315-317 REGENT STREET, LONDON W1R 7YB, ENGLAND
www.minerva-press.co.uk

Checkers captured the imagination of Americans on the Missouri frontier, colorfully illustrated here in George Caleb Bingham's *The Checker Players* (1850).

it was practically an obsession, with thousands of hours of study and practice." Such devotion enabled Tinsley to "groove his play," as my grandfather would say. The result? Fewer than ten lost match games in the half-century between 1945 and 1994. Four of those losses came while Tinsley was still in his formative years. Two more came in 1992 in a match against Chinook, the checkers counterpart to the chess-playing computer Deep Blue and brainchild of Jonathan Schaeffer, of the University of Alberta in Edmonton, Canada.

Played in London at the same table used by Gary Kasparov and Anatoly Karpov in their 1986 world chess match, the Tinsley-Chinook match ended 4 games to 2 and 33 draws, with Tinsley coming from behind to win. Two years later man and machine met again. Tinsley was now 67 years old and in failing health; Chinook was five years old, but five times smarter than its '92 version: able to analyze at least six million positions a minute, and drawing on a 250-billion-move database replete with opening lines, cooks and infallible endgame plays.

Still, the program managed only six draws before Tinsley had to forfeit because of his health. (He died a few months later.) It was a performance that calls to mind the old phrase "fearfully and wonderfully made." Or in the words of Tinsley himself, "I have a better programmer than Chinook. God gave me a logical mind." And one other thing: if you pressed my grandfather he would tell you that he played Tinsley a 30-game match for the world title in '89. It was hard-fought checkers, with one game lasting six and a half hours before ending in a draw. Grandfather would also tell you the final score for the match. Not one to overstate things, I just tell people that he came in second.

Nepotism aside, though, winning is not everything—especially in checkers. As one writer puts it, "Ours is no bloody battle, / With woe and horror fraught, / Our joust is of a gentler kind, / A measuring of mind with mind; / A tournament of thought." And another, with a Frostian flair: "While shrieks the blast without, and drives the snow / and Heaven's artillery threatens all below / serene, within, we ponder o'er the squares / 'til midnight chills the hearth—then steal upstairs."

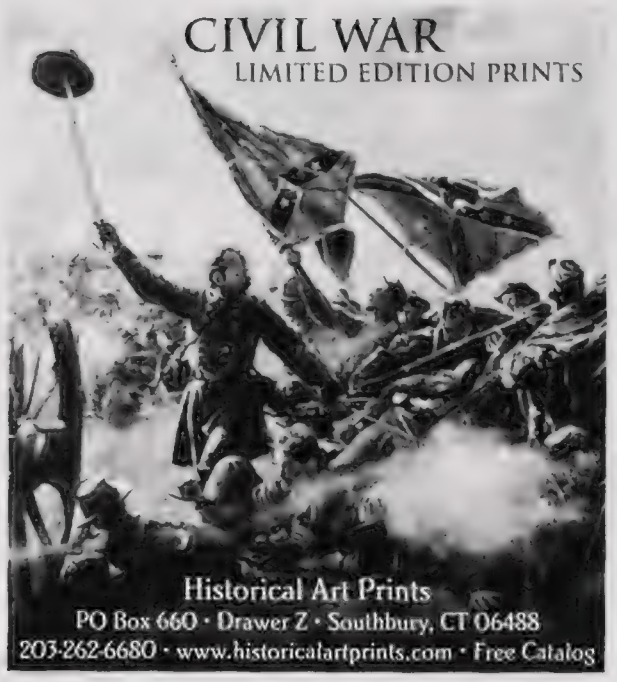
The essence of such language is that there exists in checkers an elegance and beauty captivating to the abstract mind, but lost on those not given to precision or patience. Tinsley likened the game to classical music: you have to know something about it to appreciate it. Others have compared it to mathematics: ordered, balanced, yet difficult to "see."

That is what chess master and checker expert Harry N. Pillsbury was driving at when he said: "Chess is what you see; checkers is what you know." There is, in other words, a prerequisite of experience in checkers, where chess is the flatterer of youth and raw ability. If you doubt that claim, just take a look at a roster of world chess champions, who have been rather consistently unseated by younger opponents. Checker champions, by contrast, are known not by their youth, but by their hoary heads. They are men of wisdom who have traveled the road before. Asa Long, checkers' Iron Man, is both the exception and the rule. Long won the American Tournament in 1922 at the age of 18; he won again in 1984 at the ripe old age of 80.

Of course, good "crossboard" ability is essential in top-notch checker play. Tinsley claimed he was able to look 30 moves into a game. For him, the board was almost superfluous. For Robert Yates it was. World champion (1876) at age 19, Yates once "turned his back to twenty-five boards and won every game," according to checker authority W. T. Call, after which Yates "called out the moves of both sides in all the games as rapidly as he would have read them from a book. He could also call them off backward without effort."

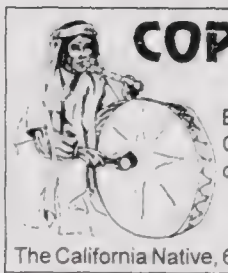
That's not to say you have to be a genius to play checkers. Just that there is a vast difference between the "wood pusher" and the master player. A good way to comprehend that difference is by studying "problems," especially endgame problems. According to onetime world champion Walter Hellman, "This is where most of the science comes in. Like in golf . . . You might hit a long drive, but if you six-putt you're beaten." Some of the bet-

Henri Matisse's sons, Jean and Pierre, play *le jeu de dames* ("the game of women," or checkers), as his wife and daughter look on in *The Painter's Family* (1911).


CIVIL WAR
LIMITED EDITION PRINTS
Historical Art Prints
PO Box 660 · Drawer Z · Southbury, CT 06488
203-262-6680 · www.historicalartprints.com · Free Catalog

Small Print A Problem?
Fiber Optics
TaperMag™
Could Be The Answer
TaperMags are unique Fiber Optic Magnifiers
Increase the size of Print by 2 1/2 times.
No lenses, batteries or bulbs.
Requires no focusing. Easy to use.
40mm TaperMag™ $79.95 + S/H
Other sizes available send for our free brochure.
Made in USA by TaperVision, Inc.
3 Vision Road, Pomfret, CT 06258
860-963-0467
www.tapervision.com

OAXACA
The way you always imagined Mexico to be...
Spend 5 days/4 nights
in a 16th. Century Convent
$167* deluxe room
CAMINO REAL OAXACA
Call: 1-800-7Camino (1-800-722-6466)
and ask for our Oaxaca Magic
*Per room, per night. Minimum stay of 4 nights. 4/11/99 to 12/17/99


COPPER CANYON
Costa Rica and More
Explore Mexico's Copper Canyon and Costa Rica on our deluxe escorted and custom adventures. For free newsletter:
1-800-926-1140
www.calnative.com
The California Native, 6701 W. 87 Pl, Los Angeles, CA 90045

MISSING A PIECE OF YOUR PATTERN?®

Replace pieces or add to your sterling silver at up to 75% off retail. We specialize in new and used flatware and hollowware. Over 1,200 patterns in stock. Call or write for a free inventory of your sterling pattern. *(We buy sterling silver, with a careful appraisal for maximum value.)*

Pattern shown: Chantilly by Gorham

Beverly Bremer
SILVER SHOP
3164 Peachtree Rd., NE, Dept. SM, Atlanta, GA 30305 / Mon.-Sat. 10-5
404 261-4009

MEN'S WIDE SHOES
EEE-EEEEEE, SIZES 5-13
FREE catalog • High quality • 160 styles

HITCHCOCK SHOES, INC.
Dept. 21H Hingham, MA 02043
1-800-992-WIDE www.wideshoes.com

GALÁPAGOS · PERU
ANTARCTICA · TURKEY
Travel in a small group on active, upscale adventures that combine learning and luxury.
FREE BROCHURE AND VIDEO
(510) 420-1550 INCA incafloats@aol.com

AUTHORS WANTED
800.278.8533
rutledgebooks.com
RUTLEDGE BOOKS, INC.
Dept. SM, P.O. Box 315
Bethel, CT 06801
Successful, full service subsidy publisher can transform your manuscript into a quality book... and promote it. Send completed work for a **FREE** assessment. **FREE** brochure.

AFRICA • CHINA • INDIA • JAPAN • NEPAL • SRI LANKA • TAIWAN
Since 1989
UPTON TEA IMPORTS
Purveyor of the World's Finest Teas
1-800-234-8327
www.uptontea.com
Free catalog listing over **220** varieties of garden-fresh, loose tea
231 South St. * Hopkinton, MA 01748

Bargain Books
America's *biggest* selection. Save 30% on current books, up to 80% on overstocks. Biography, History, Travel—over 60 subject areas. Hundreds of new arrivals monthly.
Free Catalog: 1-800-677-3483
Hamilton 6049 Oak, Falls Village, CT 06031-5005

Trying to best grandfather at checkers remains a signature thrill of childhood, immortalized above by Harry Roseland in *The Checker Game* (c. 1905).

ter texts for problem study include: *Kear's Encyclopedia* by James Kear, Jr. (1950); John T. Denvir's *Traps and Shots* (1905); W. T. Call's *Midget Problems* (1913), a puzzle book of two-on-two situations (two white pieces versus two black pieces); Tom Wiswell's *Checker Magic* (1943) and *Learn Checkers Fast* (1946), the latter with an introduction by Jack Dempsey; and Willie Ryan's *Tricks, Traps & Shots* (1950), an excellent text by one of the game's more flamboyant players.

By studying problems the tyro learns that it is possible to win in certain three-on-three situations by something called Second Position, a 79-move sequence of flanking maneuvers. The novice learns also that it is possible to lose a checker game in just five moves—if you stumble into the 350-year-old Canalejas Cannonball. The Cannonball is what is known as a stroke, a long series of "pitches," or forced jumps. (In checkers, if a player *can* jump and capture an opponent's piece, he must. A common strategy is to forfeit a piece in a pitch, forcing an opponent to jump to a particular square.)

Other classic strokes include the Goose Walk, the Boomerang, Wyllie's Switcher Winder and Duffer's Delight. Each of these old stumpers employs the element of surprise, but each has its own distinctive character as well. Willie Ryan called the Canalejas trap a "five-move demoralizer"; Tom Wiswell said it is "probably the most natural loss in the game of checkers." Duffer's Delight is like a haymaker that hits you from out of nowhere. One moment everything looks good, your position looks strong; the next moment you're picking yourself up off the floor.

Other strokes employ a "chop suey" approach where the pieces are mixed up in a completely unorthodox fashion. In these positions you expect a snake in the grass; it's just that you can't see it in time. Wyllie favored an opening called the Switcher Winder for that reason. He said, "The 'Switcher' was so named by my esteemed and dear old friend, Mr. George Wallace, of Glasgow; and it was not inappropriately titled, for with that weak and apparently silly opening I have 'switched' and perplexed many an eminent player. . . . Indeed, I have probably won more games by this particular opening than by any other opening upon the board." Though the

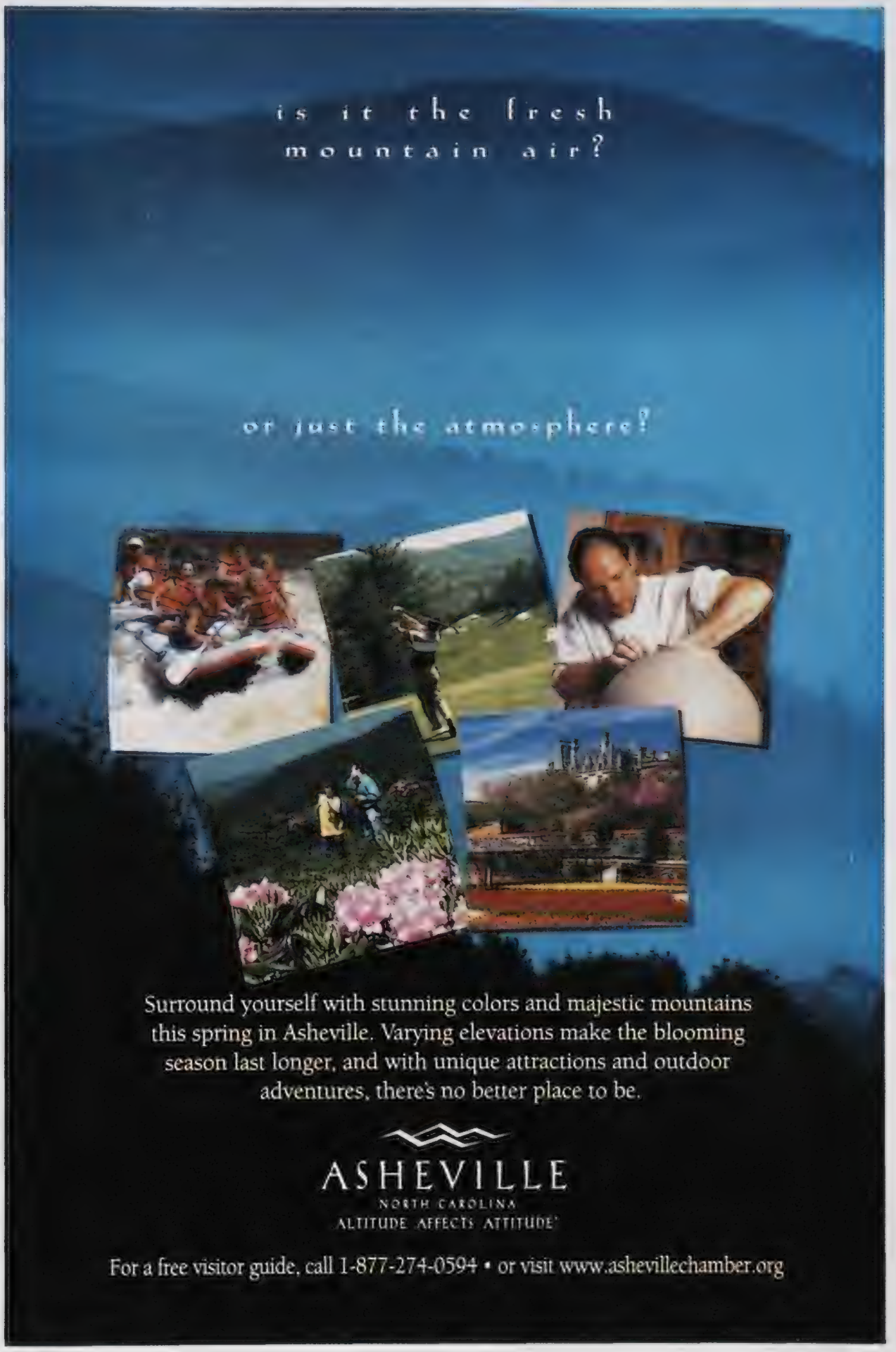
...ERY OF KATHY AND NOEL WADSWORTH (PROVENANCE: GALLERIES MAURICE STERNBERG, CHICAGO)

Switcher may appear to be a "weak" or "silly" opening, it catapults the game into a dangerous series of pitches and traps that can catch an unwary opponent off guard. Since Wyllie's day, however, most knowledgeable players know about the Switcher and are savvy enough to avoid its pitfalls.

Another old trap, the Steel Stroke, credited to James Steel of New Castle, England, is a fine example of how intricate forced checker play can be. It came up once when former world champion Robert Stewart of Scotland went with friends to play Ajeeb, the "automaton" checker player then on exhibit at the Eden Musee, a wax museum and theater in New York during the early part of the century. Normally the "robot" (or more accurately, the checker expert hidden inside an elaborate costume) spent its days mopping up amateurs. And even with Stewart things seemed to be going well. Until the stalwart Scots miner lit a 12-16 pitch to initiate the explosive Steel shot. Ajeeb then did not move for some time, and finally the attendant told Stewart he must move more quickly. Stewart then replied that it was Ajeeb's turn to move. Then, according to Willie Ryan, "the attendant . . . pretended to wind up the figure, announcing that the game could not be finished because the main steel spring in the machine was out of order!"

RCA eventually bought the Ajeeb costume and employed it (with a succession of hired checker experts inside) as an attraction at department stores and on Coney Island. The "RCA Victor Checker Playing Robot," it was called. During its illustrious career, Ajeeb reportedly handed defeat to such celebrated personages as King Edward VII of England, Admiral Dewey, Theodore Roosevelt, Sarah Bernhardt, Edgar Allan Poe and Christy Mathewson. One journalist wrote, "The robot is about 6 feet 6 inches tall, 22 inches wide, and weighs 200 pounds. A gigantic imitation of a human figure, it sits cross-legged to play, its large right hand ponderously and squeakily moving the checker pieces when it becomes its turn to play. Whenever a smart aleck attempts to cheat, the automaton sweeps the board with the heavy arm, sending checkers scattering to the floor, while it tosses its massive head in derision and disdain."

Such stories are common in the checker fraternity. Hugh Burton, Tennessee state champ for 32 years, tells how he got his start in checkers at a


is it the fresh mountain air?
or just the atmosphere?
Surround yourself with stunning colors and majestic mountains this spring in Asheville. Varying elevations make the blooming season last longer, and with unique attractions and outdoor adventures, there's no better place to be.
ASHEVILLE
NORTH CAROLINA
ALTITUDE AFFECTS ATTITUDE
For a free visitor guide, call 1-877-274-0594 • or visit www.ashevillechamber.org

EARN $50 U.S. SAVINGS BONDS.

Time to cruise the malls.

Lunar rover
National Air and Space Museum

Shop to the moon and back again. With the Smithsonian Card, every purchase earns you points towards $50 U.S. Savings Bonds*, at the same time it helps the Smithsonian. All without an annual fee. Apply today for the only credit card that lets you save for your future while you support the Smithsonian.

To apply, call toll-free 1-888-33-CASTLE or visit us at www.smithsoniancard.com

Accepted where you see DISCOVER NOVUS

* Earn 1 point for every $100 in purchases. You will automatically receive a Series EE $50 U.S. Savings Bond when you accrue 50 points provided your account is in good standing. Value stated at maturity. See U.S. Savings Bond Program Terms and Conditions that accompanies your Cardmember Agreement. ©1998 Greenwood Trust Company, Member FDIC.

country store, playing on a "board made out of plywood and shoe polish" with "Coca-Cola tops for checkers." After Burton won the Tennessee title, one of his friends, a local school superintendent, asked him to visit a country store just across the state line in Walnut, Mississippi. "Go on a cold, bad day," he said, "and you'll find a fellow there named Homer Gunn. He laughs and brags. Just stand and watch, and he's gonna ask you to play." So Burton went to Walnut one day in January. And sure enough, Homer was there skunking the locals, and bragging as usual. "You know what to expect!" he'd say.

Burton just stood by and watched as he'd been told. "Young fellow, do you play this game?" Gunn asked. Accentuating his Tennessee drawl, Burton replied, "My boy and I play." It was enough. When Gunn lost the first game he said quickly, "Let's start another one, you just got lucky." With the second loss his suspicion was piqued: "Where do you live?" he asked. Burton convincingly explained that you go down such 'n' such a road, "turn this way, then that way, and then go to the fourth house." Finally, when Gunn had taken all the abuse he could stand, he looked at Burton across the board and said, among other things, "You don't really live around here, do you!"

It seems there is an unwritten rule in checkers: that the game is, and always will be, just a game. Oh, there are those who talk enthusiastically about the merits of checkers: how it is intellectually stimulating, and beneficial to the developing mind; how it fosters a dogged resolve to look for a solution even when things appear grim. Les Balderson, current president of the American Checker Federation (ACF), once told me that if "more people played chess, checkers, bridge—mental games—there'd be less drinking, dope and all that kind of stuff."

"If there were more money in checkers, I could spend more time at it," said Tim Laverty (at 42, one of the youngest at the tournament). With a top prize of only $810 at the '98 National, it's not likely that Richard Hallett (the current U.S. champ) will be making the cover of *Forbes* magazine any time soon. Karl Albrecht, master player and former Michigan state champ, offered perhaps the most realistic hope for devotees of the game: "It would be nice to make expenses."

Albrecht may be remembering the man whose games he helped edit in a book called *Big League Checkers*. Willie Ryan is the man, and if anyone could lay claim to the title "professional checker player," it was he. From the mid-'20s to the early '50s Ryan toured, wrote books and edited a magazine called the *American Checkerist*. (Grandfather once submitted a problem to the *Checkerist*, and Ryan

If chess is the game of cerebral bad boys, then checkers is the game of affable sportsmen.

wrote back that the idea was "as old as Uncle Tickleberry's tailcoat." The letter closes with Ryan's patented phrase, "Checkeristically Yours.") Sadly though, when all the checkering was said and done, Ryan had very little to show for it. He died after suffering a heart attack at the Florida Checker Foundation, at the age of 47, reportedly having ignored medical advice that he was seriously in need of rest. Checker players, I am told, took up money to help with his burial. W. T. Call gets the last word on the subject: "Checkers is a diversion. Those who try to make it a livelihood do not succeed."

Nor, I would add, do overbearing windbags. As W. Patterson put it in *The Game of Draughts* (1879) "Bear in mind three essential qualities in all games of intellect:—Never to show selfishness or to wound the feelings of your adversary.—To be modest with a good game.—To lose without ill-temper and to win without bragging." This kind of advice runs like a scarlet thread through the literature of the game. Players who choose to ignore it do so at their own peril.

Ron King of Barbados is a good example. When he entered the 1986 U.S. Open as a virtual unknown and started talking loudly about playing Tinsley, everybody, as Grandfather recalls, was "laughing behind their sleeves." King went on to surprise everyone, making a good showing in that tournament. He is now regarded as the best player in the world. In terms of checker etiquette, however (and in spite of his name), he has never quite made it to the king row. Were chess his game, King's relative braggadocio would be regarded as normal, even mild. But if chess is the game of the cerebral bad boys, all on the verge of insanity (SMITHSONIAN, January 1998), checkers is the game of the affable sportsmen, all firmly rooted in civility.

It's not likely that checker players will soon be demonstrating the toddler tantrums and gladiatorial spirit that has come to characterize modern sports. (The juiciest gossip in checker circles a few years back was that a North Carolina master player blundered in a game with King and slung his checkers off the board.) Oh there may be a killer instinct in competitive checkers—Grandfather told that to a reporter once and the guy laughed—but it is a killer instinct balanced by a

EARN $50 U.S. SAVINGS BONDS.

Morse telegraph key
National Museum of American History

S...H...O...P. With the Smithsonian Card every purchase earns you points towards $50 U.S. Savings Bonds,* at the same time it helps the Smithsonian. All without an annual fee. Apply today for the only credit card that lets you save for your future while you support the Smithsonian.

To apply, call toll-free 1-888-33-CASTLE or visit us at www.smithsoniancard.com

ACCEPTED WHERE YOU SEE DISCOVER NOVUS

* Earn 1 point for every $100 in purchases. You will automatically receive a Series EE $50 U.S. Savings Bond when you accrue 50 points provided your account is in good standing. Value stated at maturity. See U.S. Savings Bond Program Terms and Conditions that accompanies your Cardmember Agreement. ©1999 Greenwood Trust Company. Member FDIC.

A Bold Plan, A Bright Future.

Establish Your Charitable Gift Annuity with the Smithsonian.

The Smithsonian. The name alone invokes endless possibilities, from art collections to scientific discoveries to a showcase of American treasures. It is a place like no other.

To keep the dream alive for future generations, your help is needed. Your Charitable Gift Annuity will strengthen the Smithsonian while enhancing your retirement and guaranteeing you income for life.

Advantages of a Smithsonian Gift Annuity include lifetime payments at attractive rates.

Sample rates (one beneficiary)

Age 65	7.0%
Age 75	8.2%
Age 85	10.5%
Age 90+	12.0%

Plus, receive significant tax benefits for your charitable contribution.

For *confidential, no obligation* information, call toll-free or write today.

☐ Send info. on a Smithsonian Charitable Gift Annuity
Birthdate(s):_____

☐ I want to know more about gifts that provide me with income for life

☐ Send information on including the Smithsonian in my will

Name: _____

Address: _____

_____

Phone: _____

Smithsonian Legacy Society
1000 Jefferson Dr. S.W.
Washington, D.C. 20560-0035

PGSM908SM

Smithsonian Institution
1000 Jefferson Dr. S.W.
Washington, D.C. 20560-0035

Smithsonian Legacy Society
(888) 419-7584
e-mail: legacy@omd.si.edu
www.si.edu/giving

phlegmatic and fun-loving humor. Wyllie was once asked during a game: "Do you mind my smoking?" His response is classic: "Na, na; it dis'na hurt me as lang as ye dinna spit on ma claes [clothes]."

Carson Gullett, a retired pastor and the current U.S. Minors champ, puts it this way: "There is a certain amount of humor in checkers. It's good when you can laugh at yourself. Humor is a medicine compounded by God for the soul."

That truth was poignantly illustrated in a round of play at the '98 National when one of the master players asked to borrow, of all things, a playing board. The request was passed on to ACF president Les Balderson, who on hearing it, looked up in the general direction of the offending member and said rather loudly, "Ask him if he brought his shoes and socks."

So in these days of sportaholic tendencies and tattooed cross-dressing dribblers, may I suggest that you consider joining forces with the unpretentious ladies and gentlemen of the green and buff squares. Plato once said: "I do not live to play; but I play in order that I may live, and return with greater zest to the labors of life." And isn't that the goal?

Oh sure, you'll be laughed at, you'll be lampooned. Ego and froth have a wide following today. But the rewards of the game are immeasurable: elegance, balance, beauty, simplicity—and perhaps most important, the fraternity of those who have tasted the mysteries of checkers.

That is what Grandfather seems to enjoy most about the game. When he won the Virginia state tournament last year, I called to congratulate him on the victory. Deflecting my praise, as he usually does, he said with a kind of boyish delight, "Ah, we had a barrel of fun."

Virginia-based writer Tim Hensley has yet to beat his grandfather at checkers. This is his first article for SMITHSONIAN.

Great Feuds in Science

Hal Hellman

Wiley, $24.95

Portraits of Discovery

George Greenstein

Knopf, $24.95

SCIENCE, IN THE ABSTRACT, SETS ITself apart from the humanities, as an impartial, analytical and objective pursuit of real knowledge, which it likes to call truth. The pure scientist is cloistered in a laboratory, or wanders forth into the world armed with instruments of precise observation and measurement. Freed from the illusions of art, the conflicting memories of history, the uncertain leaps of literary imagination, the hard analytical mind of science tells us the way things really are. In his *Portraits of Discovery*, astronomer George Greenstein quotes the early German physicist Ludwig Boltzmann to this effect: "The stars bend like slaves, to laws not decreed for them by human intelligence, but gleaned from them."

What makes both Greenstein's *Portraits* and science writer Hal Hellman's *Great Feuds in Science* so delightful is the way in which they give us science, not in the abstract but in the flesh. In doing so, they show us science following what the novelist Samuel Butler called "the way of all flesh." There is, of course, a great difference between a novel and a scientific paper. But science grew out of the humanities; it was originally known as natural philosophy. And it is, like other branches of the humanities, a pursuit subject to error, emotion, ego, indeed all the flaws that make us human.

Hellman's focus on the great feuds, from Galileo's clash with the pope to the still smoldering attack by Derek Freeman on Margaret Mead, is more than a retelling of familiar stories. He is a thoughtful writer, and has done his own research, looking for what drove his protagonists into combat—for deeper meanings. In Hellman's pages we find both the hurled invectives and what lies at the heart of these disputes.

For example, when Newton and Leibniz, giants of 18th-century physics, battled over who had invented "the calculus" first, there were deeper issues at stake. Newton's universe ran according to precise laws, as mechanical as clockwork, fixed in space and time, while Leibniz was imagining a world of relativity, not realized until Einstein. Yet such lofty differences were hardly a factor in why a committee of the British Royal Society gave priority on the calculus to Newton. The reason for this: although Leibniz was a member, Newton was head of the society and stacked the committee with his supporters.

Darwin's publication of his theory of evolution in 1860 provoked a feud that still stirs passions. "I am sharpening my claws and beak in readiness," the biologist T. H. Huxley told Darwin just before publication. When Huxley met the famed cleric Bishop Wilberforce in debate at Oxford soon after, the bishop asked the biologist whether it was through his grandfather or his grandmother that he claimed descent from a monkey. "I should feel it no shame to have risen from such an origin," Huxley shot back. "But I *should* feel it a shame to have sprung from one who prostituted the gifts of culture and of eloquence to the service of prejudice and of falsehood."

Such barbs and retorts are hardly a thing of the past, as Hellman shows in his account of the Derek Freeman-Margaret Mead controversy, whose

A REFRESHING ISLAND GETAWAY.
For a Sailing Adventure, 13 Historic Schooners depart Camden & Rockland. 3,4 & 6-Day Cruises from $335.
www.sailmainecoast.com
MAINE WINDJAMMING 1-800-807-WIND

COPPER CANYON
CUSTOM DESIGNED ADVENTURES
Naturalist-trained native guides • Remote wilderness lodges
Birding • Natural History • Cultural Contacts • Photography
Sierra Madre train • Tarahumara & Mayo Indians
1-800-843-1060 www.canyontravel.com
Columbus Travel, 900 Ridge Creek, Bulverde, TX 78163

Fine Arts Videos
Music • Art • Film • Culture • Gifts
FREE CATALOG
800-884-0555 ext. MA
www.karolmedia.com

ARCTIC UNDERSEA
Pioneering expeditions to new ocean frontiers via high-tech submarines.
800-628-8747
www.zeco.com
ZEGRAHM EXPEDITIONS

www.vancort.com
Telescopes ◇ Kaleidoscopes ◇ Compasses
Orreries ◇ Magnifiers
Timepieces & Weather Instruments
Van Cort Instruments, Inc.
South Deerfield, MA
800-432-2678 413-665-2000

AUTHORS WANTED
Leading subsidy book publisher seeks manuscripts. Fiction, non-fiction, poetry, juvenile, religious, etc. New authors welcomed. For free 32-page illustrated guidebook TD-72, call 1-800-821-3990 or write to:
Vantage Press, 516 W 34th St., New York, NY 10001

PICTURE CREDITS

100, 101 Musée Gustave Moreau, Paris (3); 102 UCLA at the Armand Hammer Museum of Art and Cultural Center, Armand Hammer Collection, Los Angeles; 103 Metropolitan Museum of Art, New York. Bequest of William H. Herriman; 104 Musée Gustave Moreau (2); 105 Art Institute of Chicago. Gift of Mrs. Eugene A. Davidson; 106-107 Musée Gustave Moreau.

PAIL & SHOVEL PIN
Essential for summer! Designed and made in our Newport Workshop. Sterling silver $45, 14k Gold $330. Add $4 handling. Catalog (800) 767-6411.
WEB: breakell.com
1 7/8"
J.H. Breakell & Co.
132 Spring Street, Dept. SMPS, Newport, RI 02840

LONDON FLATS
Short Term - Privately owned
PARIS PROPERTIES - COTSWOLD COTTAGES
THE LONDON CONNECTION
MR. THOMAS MOORE III
TOLL FREE PHONE: 888-393-9120
FAX: 801-393-3024
E:MAIL london@relia.net

Special Millennium Gifts from
Shepherd's Watch®
Capture the romance of simpler times.
Authentic recreations of
SUNDIAL JEWELRY
in silver, gold and pewter.
Call for a brochure or visit our web site:
1-800-786-4387 • www.shepherdswatch.ca

Cartouche
18K Solid Gold or Sterling Silver.
A Talisman with *Your Name* in Hieroglyphics.
Protective Charms, Powerful Amulets, Beautiful Gifts.
P.O. Box 309-SM, Delmont, PA 15626 E-mail: sm@cartoucheltd.com
For a Free Catalog Call 1-800-283-4978

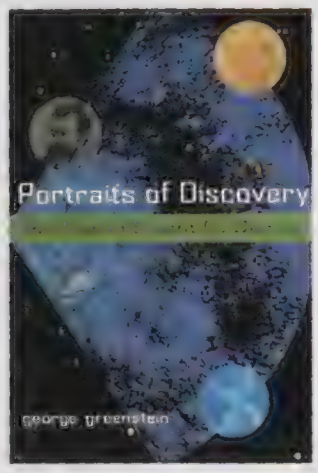
The only address you need to know...
www.windandweather.com
Your best source for
weather instruments.

EXPLORE ANTARCTICA...
...A land like no other in the geography and history of the world...aboard the 122-passenger *Clipper Adventurer* during the austral spring and summer, 1999/2000.
1-800-282-7245
CLIPPER CRUISE LINE

Wall A Tree ™
"for any place there isn't space"
Artificial Christmas tree made with top quality flame retardant garland. Hangs like a picture out of reach of children and pets. Office, home, apartment, guest room... Made in U.S.A.
800-344-2796
www.wallatree.com

EUROPE $228 ROUNDTRIP
China/Asia $375. Central & So. America $220. India, Africa, Australia $699. ALL ROUNDTRIP!
AIR COURIER ASSOCIATION
1-800-822-0888
8 am - 5 pm Mtn. time (303-215-9000)
www.aircourier.org

dust has hardly settled. Hellman offers a balanced account of Freeman's attempt to debunk Mead's characterization of the culture of adolescence in Samoa. But he notes how one scientist may gain prominence "on the back of [another's] fame."



In *Portraits of Discovery*, George Greenstein writes with an insider's feeling for contemporary science and its great minds. But he is fascinated by the complexity of people as well as the beauty of ideas, and gives us his subjects warts-and-all. Here we find George Gamow, who leaps from nuclear physics to cosmology to the genetic code, delighting his friends with magic tricks and Russian poetry, and drinking himself to death.

Or physicist Richard Feynman, who blazed a new trail into the mysteries of quantum mechanics and electromagnetism, even as he proceeded to seduce the wives of colleagues, friends and graduate students whose careers depended on him. Feynman liked to say, "I'm a one-dimensional sort of guy." And Greenstein illustrates this with Feynman's reaction to witnessing the first atomic bomb test in the New Mexico desert: he was puzzled by the mushroom cloud and began trying to figure out what had caused it. In contrast, J. Robert Oppenheimer, who directed the project to develop the bomb, was thinking of a line from the Bhagavad Gita: "I am become death, the destroyer of worlds."

Or Luis Alvarez, who helped develop radar and the atom bomb in World War II, and later, with his son Walter, put forth the theory that an asteroid caused the extinction of the dinosaurs, but who is equally remembered for participating in the postwar congressional witch-hunt that destroyed Robert Oppenheimer's career.

Woven into these profiles are Greenstein's reflections on the way science is changing—big science now involves teams of collaborators (a recent physics paper was published with 365 authors), as leading scientists become administrators who resemble corporate CEOs. He also muses on the way science remains unchanging—in its discrimination against women. Only 3 percent of physicists in the United States are women, ten times less than in Italy or Turkey. The use of the telescope at the Palomar Observatory in California was restricted to male astronomers until the mid-1960s.

In one respect, Hellman's and Greenstein's stories have a common thread: the resistance to new ideas or observations. "The ideas of one's field," Greenstein says, "won at such great cost of time and effort, won by untold numbers of workers—these are precious. The sense arises that they are one's own property, zealously to be guarded against outside depredations. Science, in fact, is a community, and like all communities, scientists have a tendency to close ranks against outsiders."

Both of these books try to humanize science, but in the end neither contemplates why science stands apart from the humanities, or what is lost in the separation. There is only a hint of this in Greenstein's confession, offering his reasons for scientific work: "Science is worth doing because it teaches us something of the true scheme of nature, and of our place in that scheme. It teaches us our address in the universe. These are enough for me. They are enough for most scientists. I have yet to meet a one who works for the good of humanity."

Reviewer Paul Trachtman is a writer who is based in New Mexico.

Phenomena, Comment & Notes [p. 18]

Gold vs. Grain, The Hydraulic Mining Controversy in California's Sacramento Valley by Robert L. Kelley, Arthur H. Clark Company (Glendale, California), 1959

"Where Have All the Flowers Gone? Early Environmental Litigation" by Waverly B. Lowell, from *Prologue: Quarterly of the National Archives*, National Archives-Pacific Sierra Region, Vol. 21, No. 3, Fall 1989

Montpelier High School [p. 40]

Vermont Image Processing Teachers Website: http://mps.k12.vt.us/ipt/iptindex.htm

Javelinas [p. 52]

Javelinas and Other Peccaries by Lyle Sowls, Texas A&M University Press, 2nd ed., 1997

Evolution of the Vertebrates by Edwin Colbert and Michael Morales, Wiley-Liss, 4th ed., 1991

Pigs, Peccaries, and Hippos, edited by William Oliver, International Union for Conservation of Nature and Natural Resources (Gland, Switzerland), 1993

Splendid Isolation by George Gaylord Simpson, Yale University Press, 1980

Through the Brazilian Wilderness by Theodore Roosevelt, Scribners, 1914

Sculpture Garden [p. 62]

Sculpture Garden Website: www.nga.gov/feature/sculptgarden/splash.htm

Turquoise [p. 70]

The Magic of Jewels & Charms by George Frederick Kunz, J. B. Lippincott, 1915

Southwestern Indian Jewelry by Dexter Cirillo, Abbeville Press, 1992

The Turquoise Trail by Carol Karasik, Harry N. Abrams, 1993

Indian Arts and Crafts Association, 122 La Veta NE, Suite B, Albuquerque, New Mexico 87108; Telephone: 505-265-9149

The Year 1 [p. 82]

The Twelve Caesars by Suetonius, translated by Robert Graves, Viking Penguin, 1957

Everyday Life in Ancient Rome by Lionel Casson, Johns Hopkins University Press, 1998

Travel in the Ancient World by Lionel Casson, Johns Hopkins University Press, 1994

The Ancient Mariners by Lionel Casson, Princeton University Press, 1991

Ships and Seamanship in the Ancient World by Lionel Casson, Princeton University Press, 1971

Mount Athos [p. 90]

Athos: The Holy Mountain by Gerhard Trumler, Adam Editions (Athens), 1993; Telephone: 6721801, Fax: 6725015

Mount Athos: An Illustrated Guide to the Monasteries and Their History by Sotiris Kadas, Ekdotike Athenon S.A. (Athens), 1998

Treasures of Mt. Athos, Organization for the Cultural Capital of Europe (Thessaloniki), 1997

Gustave Moreau [p. 100]

Gustave Moreau: Between Epic and Dream (exhibition catalogue) by Geneviève Lacambre, Art Institute of Chicago, 1999

Gustave Moreau: Magic and Symbols by Geneviève Lacambre, Harry N. Abrams, 1999

The Unknown Matisse: A Life of Henri Matisse: The Early Years, 1869-1908 by Hilary Spurling, Alfred A. Knopf, 1998

Checkers [p. 110]

The Complete Guide to Checkers by Tom Wiswell, Collier Books (New York), 1970

One Jump Ahead: Challenging Human Supremacy in Checkers by Jonathan Schaeffer, Springer-Verlag (New York), 1997

American Checker Federation Website: http://www.primenet.com/~krow

Swim at Home™
Swim or exercise
against a smooth current
adjustable to any speed or ability. Ideal for swimming, water aerobics, rehabilitation and fun. The 8' x 15' Endless Pool® is simple to maintain, economical to run, and easy to install inside or outdoors.
FOR FREE VIDEO CALL
(800) 233-0741, Ext. 656
or visit www.endlesspools.com
200 E Dutton Mill Rd, Dept 656
Aston, PA 19014
ENDLESS POOLS

REMINGTON BRONZES

World's Largest Wholesale Bronze Supplier

Apx. Size	Avg. Ret	Outlet$
Desk 9"	$495	$75
Med. 12"	$795	$95
Large 22-29	$1,295	$275
Coming Thru Rye 12"	$1,195	$425

For FREE FLYER, call:
609-652-5730

BRONZE OUTLET

SMITHSONIAN POSTER

Ferrari Mystique

When Enzo Ferrari began his company 50 years ago, his cars were works of art, today they're collector's items!!

1957 250 Testa Rossa Prototype

(Photo by Enrico Ferorelli as seen in our December 1997 issue)

Poster measures 22" X 33" and is available for only $20 plus shipping & handling.

To order, Send $24.95 to:
Smithsonian Magazine
P.O. Box 23624
Washington, DC 20026-0624

OR

Order online! go to
www.smithsonianmag.si.edu
and click on our KIOSK

Smithsonian Study Tours

The Smithsonian Traveler

Credit Cards Accepted!
Smithsonian•Discover
VISA•MasterCard

Call or write for your FREE **Smithsonian Study Tours** catalogue, featuring more than 300 educational tours to 250 exciting destinations in the United States and abroad!

Smithsonian Study Tours offer unparalleled educational travel opportunities. Enjoy traveling with engaging study leaders and fellow Smithsonian Associates.

International Tours

City Interludes *Throughout the year* Extended stays in some of the world's great cities: Venice, Florence, Kyoto, Vienna, Prague, Krakow, St. Petersburg and Moscow.

Countryside Tours *Throughout the year* Relaxing journeys to England, Scotland, Wales, France, Austria, Switzerland, Italy, Hungary and the Czech Republic.

Folk Arts and Celebrations of Mexico *October 27-November 8*

China Insights *November 4-18*

Discover Ghana *November 6-16*

Treasures of Ancient Egypt *November 8-23*

Christmas Tours: Austria (Tyrol) *December 16-27*, **Mexico** *December 21-28* and **England (Canterbury)** *December 22-28*

NEW! **India at the Millennium** *December 27-January 10*

Saudi Arabia *January 13-27*

Exploring Antarctica, South Georgia and the Falkland Islands *January 14-February 4*

Patagonia: Crown Jewel of Chile *January 16-29*

The Natural Treasures of Panama and Costa Rica *January 21-29* Aboard the *Panorama.*

Panama and Costa Rica *January 21-29*

New Zealand by Land and Sea *January 21-February 3* Aboard the *Clipper Odyssey.*

Vietnam by Sea *January 28-February 10* Aboard the *Seabourn Spirit.*

Copper Canyon: Mexico's Sierra Madre *January 29-February 6*

Amazon Voyage (Peru) *February 5-12, February 19-26 and April 8-15* Aboard the *Turmalina.*

La Ruta Maya: Central America *February 10-18*

Baja Whale Watch: Baja California and the Sea of Cortés *February 12-20* Aboard the MV *Yorktown.*

East African Wildlife Safari *February 13-27*

Underwater Treasures of Bonaire *February 19-26*

Patagonia's Inside Passage *March 7-19* Aboard the *Clipper Adventurer.*

Legacy of Sicily *March 9-19*

U.S. & Canada Tours

NEW! **American Snapshots: Puget Sound (Washington)** *September 23-26* and **Lexington (Kentucky)** *October 14-17* Four-day, all-inclusive trips to charming towns whose distinctive heritage invites a closer look.

Canyons and Cultures of the Southwest (Arizona) *October 18-26*

NEW! **Pacific Coast Explorer** *October 27-November 4* Aboard the *American Orient Express.*

NEW! **Yosemite and Monterey** *November 4-12*

NEW! **Breakup of the Confederacy: Jefferson Davis' Flight from Richmond (Virginia, North Carolina, South Carolina and Georgia)** *November 5-10*

Florida Manatees *November 13-17*

Christmas Tours: Santa Fe *December 21-26* and **Savannah and Charleston** *December 21-27*

Wildlife in the Everglades *January 8-15*

Treasures of Puerto Rico *January 24-February 1*

Fighting over Florida: Seminole Wars *January 26-February 2*

Birding in South Texas *February 12-20*

Low Country Landscapes (Savannah, Georgia; Beaufort, North Carolina; and Charleston, South Carolina) *March 18-25* Aboard the MV *Nantucket Clipper.*

Smithsonian Seminars

Concentrated study of specific topics:

NEW! **The Ceramic Traditions of China (Washington, D.C.)** *October 20-24*

NEW! **Opera Lover's France** *November 3-12*

NEW! **Looking at Art: Manet to Matisse (Washington, D.C.)** *November 4-7*

NEW! **20th-Century American Furniture (Washington, D.C.)** *November 6-9*

The Art and Spirit of Georgia O'Keeffe (Santa Fe) *November 10-14*

A Sampling of Learning Adventures for Smithsonian Associates

To request a catalogue or brochure, please call (202) 357-4800. For other tour information, call (202) 357-4700; or write to The Smithsonian Associates, MRC 702, Washington, DC 20560

NEW! **Vintage France: Wines of Bordeaux** *November 10-20*

NEW! **Astronomies: On the Threshold of a Millennium (Tucson)** *December 8-12*

NEW! **Art in 18th-Century Rome (Philadelphia)** *March 23-26*

Civil War: Shiloh (Tennessee) *March 23-27*

NEW! **Opera Lover's Italy** *April 13-23*

NEW! **Civil War: Maryland** *April 26-30*

NEW! **Napa Valley Food and Wine (California)** *April 28-May 2*

Odyssey Tours

More than 20 moderately priced tours and cruises with several departure dates in 1999 and 2000. Destinations include Europe, the Mediterranean, Russia, China, South Africa and the United States.

Sojourns Stay in one place for a week or more to explore the area's history and culture. Destinations include the French Riviera, Greece, Turkey and Washington, D.C. Tours are available year-round.

Cruises Many cruises to choose from, such as the Baltic Sea Cruise, Istanbul to Rome, Australia and the Java Sea, the Hawaii Cruise, and Imperial Russian Waterways.

Egypt's Ancient Lands 12-night tours in *November, February and March*

NEW! **Christmas in London** *December 20-27*

For a Smithsonian Odyssey Tours brochure, call 1-800-932-8287.

Visit us on-line at:
www.si.edu/tsa/sst

Home | This Issue | Explore | Image Gallery | Events | Membership | Guestbook | Feedback | Kiosk

Location http://www.smithsonianmag.si.edu

Now Showing On Screens Everywhere

Dazzling images. Illuminating text. The brilliant sights and insights you've come to expect, now displayed in a whole new light. SMITHSONIAN Magazine on-line.

Refresh your mind.

www.smithsonianmag.si.edu

aol keyword: smithsonian

SMITHSONIAN (ISSN 0037-7333) is published monthly by the Smithsonian Associates, 900 Jefferson Drive, Washington, DC 20560.

© Smithsonian Institution 1998. All rights reserved. Reproduction in whole or in part without permission is prohibited.

Editorial offices are at 900 Jefferson Drive, SW, Washington, DC 20560 (202-786-2900). Advertising and circulation offices are at 420 Lexington Ave., New York, NY 10170 (212-490-2510). **Subscription Prices:** United States and possessions: $24 a year payable in U.S. funds. Canada and all other countries: add $13 (U.S. funds) for each year. 80 percent of dues is designated for magazine subscriptions. Current issue price is $4 (U.S. funds). Back issue price is $5 (U.S. funds). Periodical postage paid at Washington, DC and additional mailing offices. **Mailing Lists:** From time to time we make our subscriber list available to companies that sell goods and services by mail that we believe would interest our readers. If you would rather not receive such mailings, please send your current mailing label, or an exact copy, to: SMITHSONIAN, Mail Preference Service, P.O. Box 420311, Palm Coast, FL 32142-0311. **Subscription Service:** Should you wish to change your address, or order new subscriptions, you can do so by writing SMITHSONIAN, P.O. Box 420311, Palm Coast, FL 32142-0311, or by calling 1-800-766-2149. Postmaster: Send address changes to SMITHSONIAN, P.O. Box 420312, Palm Coast, FL 32142-0312. Printed in the USA.

THE LAST PAGE

What Good Is a List If You Can't Read It?

BY LOUIS PHILLIPS

"EVERY MAN HAS ONE THING HE CAN do better than anyone else," a wise educator once noted, "and usually it's reading his own handwriting." In my case, that is not true. I can't tell you the number of times I have rushed home from the library, flung open my notebooks and stared for hours on end at words and phrases I could not make out. Indeed, if this article were not set in type and you had to read my scrawled version of it, you would throw up your hands (and eyeglasses) in despair.

For some of us, there is comfort in knowing that other great persons have also suffered from cacography. Napoleon, for example. His handwriting was so atrocious that notes he sent to his commanding officers looked like maps of the battlefield. That learned essayist Montaigne complained: "My hands are so clumsy I cannot even write so as to read it myself, so that I had rather do what I have scribbled over again, than take upon me the trouble to make it out."

Also indecipherable was the script of the great newspaper editor Horace Greeley. He once fired a staff member who, whatever his shortcomings, had the wit to put Greeley's note of dismissal to good use. Since nobody could make out the writing, the unemployed journalist was able to pass the note off as a letter of recommendation and promptly land himself another job.

Or may I call your attention to this entry on Cleveland Abbe in an old volume of the *Dictionary of American Biography*? At the conclusion of the article about the pioneer weather forecaster, the writer observes: "From August 1893, [Abbe's] chief duty was the congenial one of editing the Meteorological Journals of the United States Weather Bureau. This caused him to write to hundreds of scholars the world over—a pleasure to him, but a task to those who had to decipher his difficult chirography."

For some of us, there is comfort in knowing that other great persons also suffered from cacography.

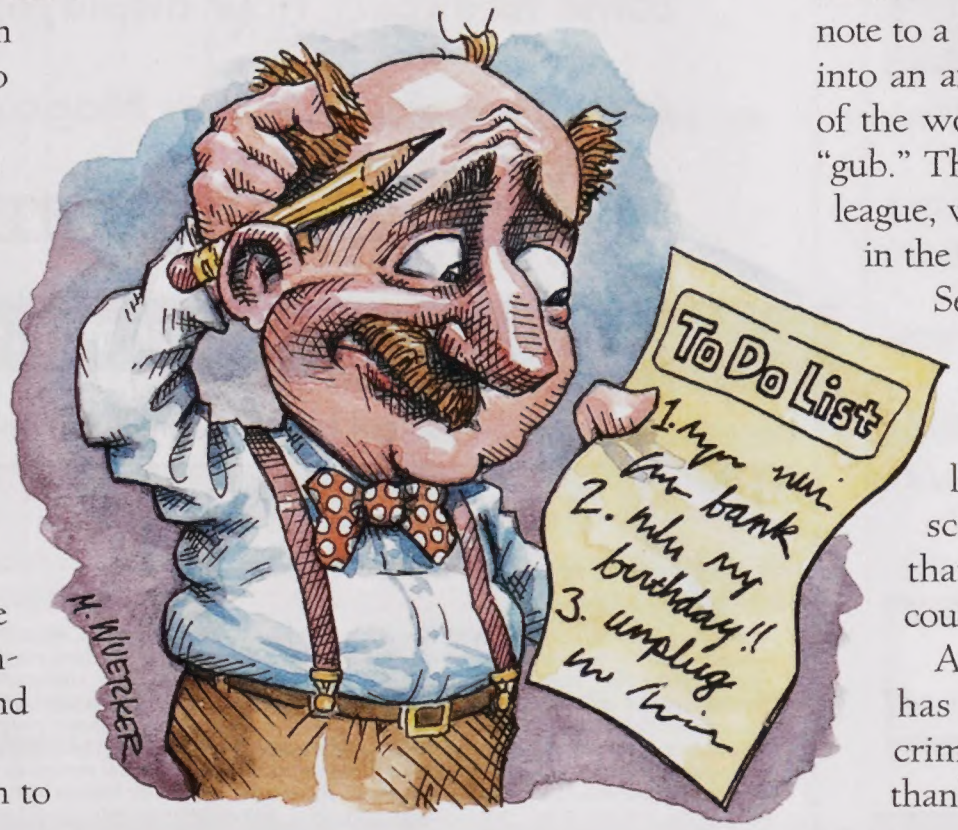
Chirography, is it?

Of course, the typewriter and the computer have pretty much done away with handwritten personal notes and letters anyway. If penmanship is a subject of concern these days, it probably matters mainly to autograph givers (see Bech, John Updike's fictional author, who suffers writer's block while signing his own name) and autograph collectors.

Tug McGraw, the onetime New York Mets and Philadelphia Phillies relief pitcher, offered this advice: "Kids should practice autographing baseballs. It's a skill that's often overlooked in Little League." Since my twin sons are devout Little Leaguers, they may well take McGraw's words to heart. I fear, however, that no matter what they do, their autographs will be unreadable. Bad handwriting runs in the family.

Illegibility can be hilarious. In his 1969 movie *Take the Money and Run*, Woody Allen portrays an inept bank robber. After he pushes his stickup note to a teller, Allen and the teller get into an argument about whether one of the words in the note is "gun" or "gub." The teller consults with a colleague, who mistakes the word "act" in the phrase "act natural" for "abt." Several of the bank's officers get into the act (or abt), and eventually the dispute over what the note says escalates into a rowdy crowd scene. The moral, I guess, is that bank robbers should take courses in penmanship.

At least my bad handwriting has saved me from a life of crime. That is something to be thankful for.

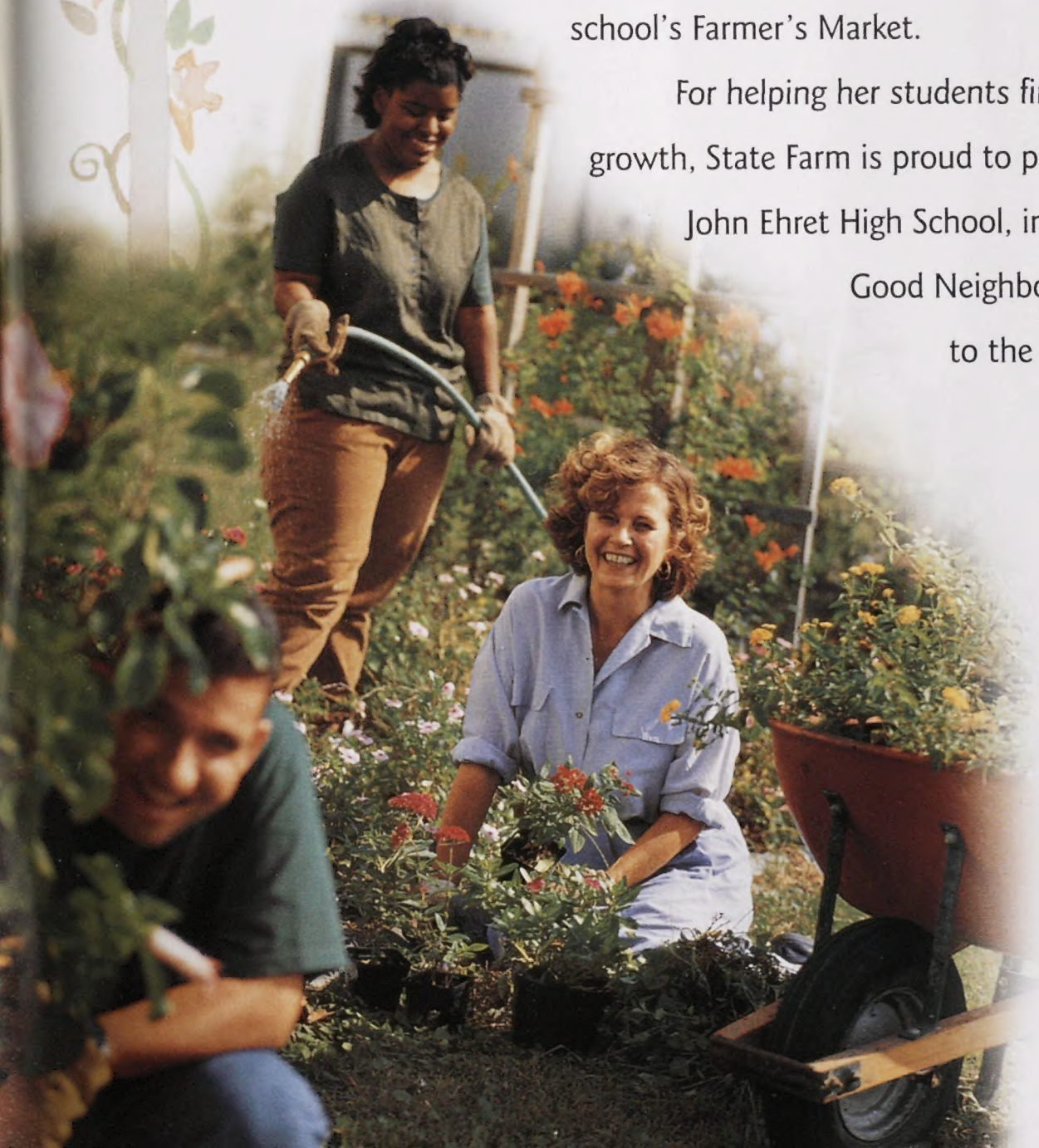


In Ms. Williger's Class, It's Not Just The Seeds That Have Grown.

Like all teachers, Karen Williger plants the seeds of knowledge and understanding in the minds of the young. Except that in this case, it's actually her students who are planting seeds and who are beginning to bloom because of it.

Her self-sustaining vocational program takes a holistic approach to academics. Students, with a variety of special needs, get a hands-on lesson in the business of horticulture. It teaches them patience and responsibility by letting them choose, plant and harvest their own crops. It hones their artistic abilities by allowing them to create their own floral bouquets and centerpieces. And it improves their self-confidence and social skills by allowing them to sell their goods and produce at the school's Farmer's Market.

For helping her students find new ways to achieve personal growth, State Farm is proud to present Karen Williger of the John Ehret High School, in Marrero, Louisiana with our Good Neighbor Award and to donate $5,000 to the school's horticulture program.



STATE FARM INSURANCE

Good Neighbor Award

STATE FARM INSURANCE COMPANIES
Home Offices: Bloomington, Illinois
www.statefarm.com

The Good Neighbor Award was developed in cooperation with The Council for Exceptional Children.

Tread lightly *and* luxuriously in Lincoln Navigator. Tread responsibly, too. In addition to being the world's most powerful luxury SUV,* Navigator is also a designated Low Emission Vehicle. In fact, Navigator runs cleaner than most passenger cars on the road today. For more information, call 800 688-8898, visit www.lincolnvehicles.com or see an authorized Lincoln Navigator dealer.

Low Emission Vehicle

Lincoln Navigator. What a luxury [ ] should be.

*models built after 12/8/98